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MARC BERLOW

JOHN FURTON, CIO at Peapod, has deployed 300 PalmPilots at two warehouses for filling online grocery orders

PDA's GET SERIOUS

PERSONAL DIGITAL ASSISTANTS aren't just personal gadgets anymore. Matt Hamblen discovers that some pioneering IT departments plan to deploy hundreds of handheld devices to connect workers with corporate databases or to run key business functions. *Report is on page 20.*

**MOBILE
COMPUTING**

ALSO: End users will like the Palm VII, but only the IT department can enable wireless queries of corporate data. Russell Kay's review is on page 66. And see our news report on page 12.

NEWSPAPER

TECH ED MAKES CORPORATE PLAY

Microsoft to debut enterprise-level functions, tools for Win 2000 at show

BY SHARON GAUDIN
AND KIM S. NASH
REDMOND, WASH.

Microsoft Corp. has been talking about becoming an enterprise-class player for more than a year now. At its annual TechEd developers conference this week, the company will focus on showing customers that, with the arrival later this year of Windows 2000, that time has come.

"It's all about enterprise-level functions," said Michel Gambier, Microsoft's product manager for Windows NT

Server. He added that Microsoft will make several Windows 2000-related announcements at the TechEd conference, including the following:

- **Server consolidation.** Microsoft is teaming up with Intel Corp. to tout the ability to run multiple applications or multiple instances of the same application on one Windows 2000 Data Center server. A demo will be run on Intel's yet-to-be-released 8-Way

Pentium III Zion System.

- **Process control.** Sequent Computer Systems Inc. and Microsoft developed a tool to manage a network's workload by enabling information technology administrators to designate specific processors to handle certain applications. A key function is that the rules will persist even after a reboot.

TECH ED '99

Focus: Windows 2000 in the enterprise

Details: Products, tutorials, industry day, hands-on labs and Microsoft partner exhibits

Speakers: CEO Bill Gates via satellite; Brian Valentine, NT development leader; and Paul Maritz, group vice president of the Developer Group

PET PROJECTS BID FOR Y2K FUNDING

Savvy IT managers aren't falling for it

BY JULIA KING

Like overnight millionaires, year 2000 project managers are suddenly finding themselves flooded with requests to fund a wide assortment of cash-worthy IT initiatives.

There are desperate pleas for new PCs, operating system upgrades and new versions of applications software. Imaging systems and optical character-recognition readers have also turned up on wish lists.

The catch is that very few of *Pet Projects, page 93*

- **An extension to Microsoft's clustering application programming interface set from IBM, which will let businesses go from a maximum of two nodes to eight nodes.** Brian Sanders, IBM's Netfinity product manager in Raleigh, N.C., said that if seven of the eight nodes fail, the workload will *Windows 2000, page 14*

3-D IMAGES MAY SPUR WEB BUYS

Multimedia sites seek to re-create in-store feel

BY JULIA KING

Will that tomato-red bathing suit make me look fat?

Can I see home plate from a seat in Section 213 at Yankee Stadium?

Online shoppers can now see the answers to those and other questions on a handful of Web sites that are deploying new interactive, 3-D and personalization technology designed to mimic consumers' *3-D Images, page 16*

J. D. EDWARDS ERP NOT ALL-IN-ONE

Green-screen apps must augment OneWorld suite

BY CRAIG STEDMAN
DENVER

Some early users of J. D. Edwards & Co.'s OneWorld ERP software have found a surprise waiting for them: They also needed to install the vendor's green-screen applications that run only on IBM's AS/400 systems.

Performance issues and

missing functionality are pushing companies to augment the 2-year-old OneWorld suite with the more stable and mature green-screen software, said several users who spoke at the annual meeting of J. D. Edwards' independent user group here last week.

J. D. Edwards does supply coexistence technology that lets the old and new products run together off of a single database, and the users who *J. D. Edwards, page 93*

Are You Open To A New Point Of View?

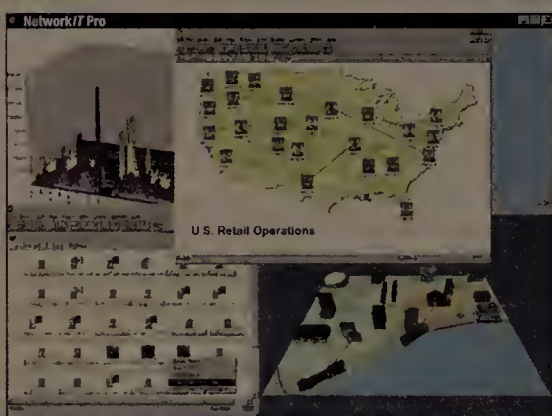
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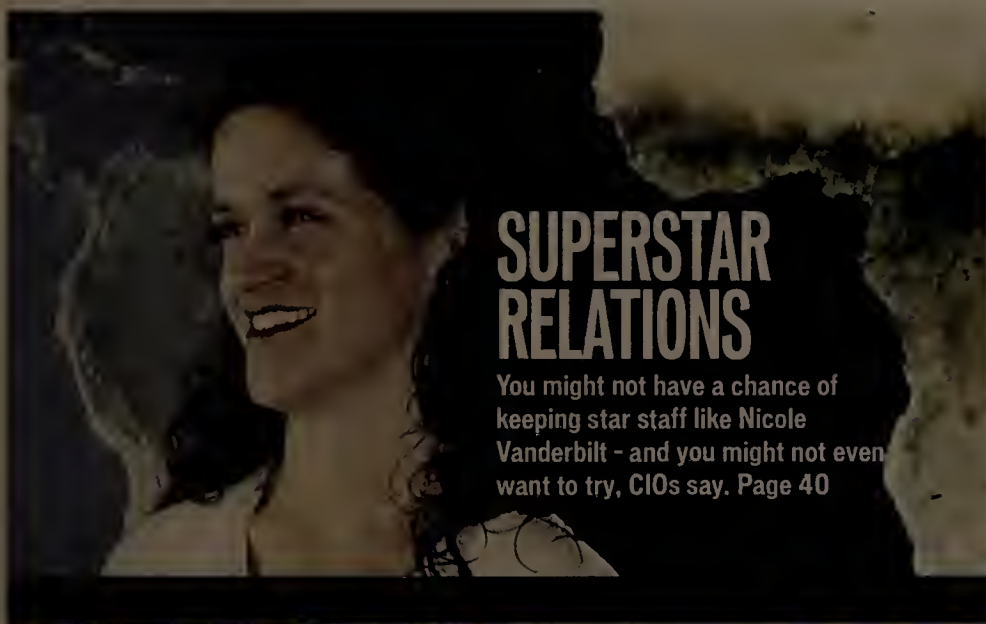
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OFFICE 2000

Administrative tools and self-help features draw early adopters to the Microsoft suite. Page 74

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MAY 24, 1999

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WE DO.

JACQUES NASSER, PRESIDENT
AND CEO, FORD MOTOR CO.,
AT CEO SUMMIT.
SEE PAGE 8.

AT DEADLINE

Microsoft Deposes AOL Chief on DOJ Call

Microsoft Corp. on Friday deposed America Online Inc. CEO and Chairman Steve Case to ask about a telephone call made to the U.S. Department of Justice (DOJ) before AOL's November takeover of Netscape Communications Corp. DOJ lead lawyer David Boies was alerted to "sensitive discussions" between Netscape and AOL several weeks before the Oct. 19 start of the anti-trust trial, Case said. Microsoft has argued that the AOL/Netscape deal demonstrates competition in the Internet software market and has suggested that AOL wanted to "warn Boies off" from asking an AOL executive about the merger when he testified for the government. Microsoft and the DOJ are talking about a possible settlement.

Raytheon Drops Suit

Raytheon Co. has dropped its lawsuit against 21 people it said had disclosed proprietary information on the Internet. The defense contractor had subpoenaed several Internet service providers in an attempt to unmask those who allegedly divulged company information in public areas on the Net [CW, April 5]. Four employees left Raytheon as a result of its probe; 17 others have been counseled about their actions.

\$5.5B Deal Sets Up Health Care Web Site

Healtheon Corp. and WebMD Inc. said they would merge in a \$5.5 billion stock swap intended to create the largest Web medical information source for physicians and consumers. Backers of the deal include Microsoft, Intel Corp. and Excite Inc. "This undercurrent of business relationships and partnerships will be difficult to challenge," said Mike Davis, an analyst at Gartner Group Inc. in Stamford, Conn.

Short Take

GENERAL ACCOUNTING OFFICE investigators said they hacked into NASA systems that calculate positioning data for orbiting spacecraft and that process scientific data received from these spacecraft.

CVS TAKES SHORTCUT TO WEB COMMERCE

\$30M Soma deal may jump-start No. 2 drugstore, but some say overhaul needed

BY STACY COLLETT

CVS CORP.'S planned purchase of online drug seller Soma.com for \$30 million offers an important lesson in e-commerce strategy: Sometimes it's cheaper to buy than to build.

As the health industry becomes the latest hotbed of Internet development, No. 2 CVS and its archrivals, No. 1 Walgreen Co. and No. 3 Rite Aid Corp., each planned to develop online selling capabilities. But CVS intends to leapfrog competitors by putting a full-service pharmacy online by late summer instead of year's end.

CVS, based in Woonsocket, R.I., "didn't realize how inexpensive buying an online retailer could be," said Sandy Raju at Merrill Lynch & Co. in New York. "You think they're going to be a couple hundred million dollars. But it's \$30 million — which is about what they would have spent developing a site of their own."

Seattle-based Soma, which in January became the first Internet company to launch a pharmacy site, gives CVS an immediate online presence, a management team with Internet experience and a fully automated fulfillment center, officials said.

Soma also gets instant name recognition and relationships with CVS's 9,000 insurance providers and inventory of 55 million prescriptions, which

Soma had struggled to build. CVS is a \$15 billion chain with 4,100 stores in the eastern half of the U.S.

But its takeover of Soma.com is by no means a turnkey e-commerce strategy. CVS plans to expand Soma's 3,000 pharmacy products to 10,000, including CVS-labeled products. It will also offer a photo-processing service.

"The only way they could meet that need is to pretty much overhaul the infrastructure — server capacity, catalogs, fulfillment infrastructure," said Carol Ferrara, an analyst at Gartner Group Inc. in San Jose. But the benefits gained in terms of online pres-

JUST THE FACTS

CVS's Tech Prescription

May 1999: Buys online drug seller Soma.com for \$30M to speed Internet presence

January 1999: Launches customer-level data warehouse software to identify customers' buying patterns and target direct-mail campaigns

June 1998: Pays \$10M for wireless LAN infrastructure and handheld scanners to automate inventory process

February 1998: Buys Arbor Drug Corp. for \$1.48B

February 1997: Buys Revco DS Inc.

ence and name recognition make the overhaul an easy trade-off, she added.

Soma officials were unavailable for comment.

Some fulfillment and distribution systems from the two companies will dovetail, according to Todd Andrews, a CVS spokesman. Soma's fulfillment center in West Chester, Ohio, is 100 miles from CVS's distribution center in Indianapolis and will supply front-store products to Soma. Also, both companies use the same automated prescription-filling system.

The Soma deal is the latest in a string of technology-related moves by CVS to broaden its market reach (see chart).

Industry observers said Soma's sale was a good move for that company, which had been struggling to forge relationships with insurers. But don't expect other start-up online drug sellers like Drugstore.com, PlanetRx Inc. and Rx.com to give up yet. Drugstore.com last week announced its plan for an initial public offering. But Soma's low sale price will likely weigh down Drugstore.com's price per share, analysts said. ▀

Linux Takes Flight on Northwest Simulators

OS used in \$34M pilot training systems

BY DAVID ORENSTEIN

Call it a driving force that's earning its wings: Linux is finding enthusiastic users as the real-time operating system for flight and driving simulators.

Northwest Airlines Inc. is spending about \$34 million to convert its 23 flight simulators from various older platforms such as VAX to Pentium II-based systems running Linux, said staff engineer Bob Aguglia in Eagan, Minn. The five-year project with consultant Opini-

cus Corp. in Clearwater, Fla., began last November.

Opinicus has ported the Fortran code of one of the flight simulation applications to Linux. The system is being reviewed by the Federal Aviation Administration, Aguglia said.

Simulators are sophisticated and demanding applications. Although they must run in real time, they must also account for the 90-millisecond delay created by the flow of hydraulic fluids in a simulator to ensure that what the pilot sees

and how the simulator moves are perfectly synchronized, Aguglia said.

The Minneapolis company auditioned several vendors last year. Systems based on Microsoft Corp.'s Windows NT and IBM's AIX Unix were proposed, but Aguglia and colleague Duane Sebens of Northwest's Hardware Engineering unit vouched for Linux as a choice capable of competing with more mainstream commercial operating systems.

Many corporate information technology departments are still deciding whether Linux — a free, open-source variant of Unix — is reliable enough to run smaller applications such as file and print servers.

At Princeton University in Princeton, N.J., where professor Warren Powell of the Castle Laboratory develops simulation systems for the freight industry, an upgrade of a large but aging Sun Microsystems Inc. system running Solaris was put on hold in favor of Linux, which runs on cheaper hardware. In a related multimedia lab, Powell said, Linux may take over for Silicon Graphics Inc.'s Irix Unix. ▀

Y2K Bill Faces 'Watered Down' Alternative, Veto

BY PATRICK THIBODEAU

The U.S. Senate may vote in the next two weeks on legislation that would limit year 2000 liability for companies. But the leading proposal faces obstacles. The White House continues to threaten to veto it, and last week, a group of Democrats offered a competing plan.

Sen. John Kerry (D-Mass.) and Senate Minority Leader

Tom Daschle (D-S.D.) unveiled their own legislation, which they said protects consumers. But critics called it a watered-down version of a bill with bipartisan support introduced by Sen. John McCain (R-Ariz.).

The McCain bill would ensure that a company's damages couldn't exceed its responsibility. But under the Kerry bill, a company could get socked for

the entire damage amount if it didn't pass certain tests. Both allow for a 90-day wait before litigation can start.

Mark Taylor Murphy, information systems director at Magla Products Inc., a maker of work gloves in Morristown, N.J., said he believes the cooling off period will encourage parties "to work through their differences." ▀



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OUTSOURCING QUALITY DROPS, BUT FEW SWITCH

Costs, hassles keep users tied to deals

BARB COLE-GOMOLSKI
SAN DIEGO

MOST companies avoid switching outsourcers, but it usually isn't customer satisfaction that cements the relationship.

Instead, companies stay bound to outsourcers because of the high cost and major inconvenience of switching, said users and analysts gathered here for a DCI IT Outsourcing conference.

Recent research from Input in Vienna, Va., shows that 20% of outsourcing customers surveyed in the past six months are considering a switch to another services company. That's in spite of most respondents' perception that the quality of outsourcing services declined in the past year.

"The barriers to switch are high — and the outsourcers want it that way," said Mike Rhodes, head of vendor management at DHC Information Services, the information technology arm of Dayton Hudson Corp. in Minneapolis.

It's costly and time-consuming to cut a new deal and to re-educate a new service provider about the business, users said.

Dayton Hudson recently outsourced management of its 14 mainframes to IBM Global Services. Rhodes' job is to

A Marriage Made in Heaven

Experts say it's impossible to construct a perfect outsourcing deal. But the following tips may result in a better deal:

- **Recognize** that you will have to manage the vendor
- Even if you've signed a multiyear deal, **reevaluate** against the market average annually
- Even if you plan to use your existing vendor for additional projects, **make the company compete** with other service providers for the work
- **Be selective** about what you have the outsourcer do. (Two-hour recovery time for a server in a remote location may be nice, but the cost of that service may not be worth it)
- **Be aware** that your IT environment will change throughout the deal. (Therefore, flat-rate arrangements and decade-long contracts may not be flexible enough)

make sure IBM delivers; he said he's hoping it does. "Just switching the software licenses back to our name would be a

huge task," he said.

For example, switching outsourcers means finding another company that can easily step

in and take over, or staffing up quickly in a tight labor market if the services are brought back in-house. It also means losing the outsourcers' knowledge of the systems they have installed or managed, analysts said.

Politics is also an issue. Union Gas, a utility in Chatham, Ontario, was told to use the outsourcer of its parent company for its infrastructure services, but IT managers were uncomfortable with the service levels and pushed — successfully — for another vendor. "We knew that if the deal didn't go through, the top management of the [favored] outsourcing vendor would be calling our top management," said Jackie Crow, manager of IT client services.

Because of the interdepen-

dencies among outsourcers and clients, Tom Mylott, an attorney at Gardere & Wynne in Dallas and author of the book *Computer Outsourcing*, recommended clauses in contracts that let customers terminate parts of the contract without voiding the entire deal.

"Oftentimes, the only choice for a customer is to terminate the whole contract, so they won't do it," he said.

Matt Saikkonen, CIO at Consolidated Freightways Corp., a transportation services company in Portland, Ore., recommended setting service expectations "one quarter at a time." Consolidated signed a five-year outsourcing deal with IBM last year for data center and network services that gives the company the flexibility of terminating specific parts of the contract. ▀

MOREONLINE

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U.S. Companies Wary of Y2K Breakdown in Latin America

Nations make power grid a top priority

BY PATRICK THIBODEAU
WASHINGTON

Kevin Greene, MIS director at Arrow Air Inc., said he can't get a straight answer about the year 2000 problem in Latin America.

"They just don't have any information for you," he said. Questions to officials in some of the countries Arrow flies to — such as Ecuador, Peru, Pan-

ama and Colombia — are met with "a pat answer or a letter that they've taken measures to correct it," he said.

Greene's Miami-based cargo carrier isn't alone. Other U.S. companies have similar questions. Year 2000 problems in Latin America could affect supply partners in both hemispheres — especially if basic infrastructure services such as power, telephones and government services are hurt.

Last week, Y2K coordinators from Latin America gathered in Washington for a meeting at the Organization of American States to offer assurances that their nations will experience few problems.

The leading priority is the electric power grid that links much of Latin America. The countries expect to implement an online system that will alert power suppliers to problems. But outside of that, officials offered few specifics on their year 2000 remediation or contingency plans.

John O'Grady is preparing for problems. President and general manager of Firestone Costa Rica SA, which is part of Bridgestone Firestone Inc.,

O'Grady's San Jose, Costa Rica, plant produces 2 million tires per year that are delivered to facilities in the U.S. and throughout South America.

O'Grady isn't worried about U.S. suppliers and is confident about the Costa Rican government's Y2K effort. It's the other countries that worry him.

Firestone intends to boost its tire inventories at Latin American distributors, O'Grady said. It bought satellite telephones and is prepared to use a HAM radio network to reach distributors. "That's a worst-case contingency," he said.

Latin American countries vary greatly in their Y2K progress. Some, like Brazil and Chile, are far ahead of Ecuador or El Salvador in their year 2000 infrastructure repairs, according to Gartner Group Inc. in Stamford, Conn. But Ellery Bann, a director of Bann Quimica Ltd. in Sao Paulo, Brazil, isn't so sure.

"Voltage fluctuations are as common as momentary power losses," said Bann, whose company makes chemicals for rubber manufacturers. If a Y2K-related stoppage occurs, backup generators alone won't be

enough to keep producing because "manufacturing would stop completely," he said. ▀

Latin American Y2K Progress

Rankings of global year 2000 infrastructure risks (power, telephone, water and government services)

LITTLE/FEW PROBLEMS

No Latin American countries ranked (U.S. and Canada are in this category)

ISOLATED TO MODERATE

Brazil, Chile, Peru and Mexico (equivalent of France or Germany)

MODERATE PROBLEMS

Argentina, Guatemala and Venezuela (equivalent of Austria or Saudi Arabia)

MODERATE TO SEVERE

Costa Rica, Ecuador and El Salvador (equivalent to Russia or the Philippines)

Corrections

A May 3 News story ["Handhelds Get Network Cards, Faster Data Access," page 12] incorrectly said Xircom Inc. in Thousand Oaks, Calif., is shipping the first CompactFlash-sized LAN card. Socket Communications Inc. in Newark, Calif., has been shipping a similar device.

An April 19 Technology section story ["Hotel Tests Ethernet Access on Phone Lines," page 81] incorrectly said download software is required for hotel users seeking

high-speed Internet access through the lport product from Atcom/Info in San Diego. No download software is required.

The April 19 ExecTech feature ["Eek! Mice and More," page 84] incorrectly credited the invention of the mouse to Xerox PARC. In fact, the mouse was invented, patented, named and used in a working system by Douglas Engelbart at Stanford Research Institute [now SRI International] in 1965.

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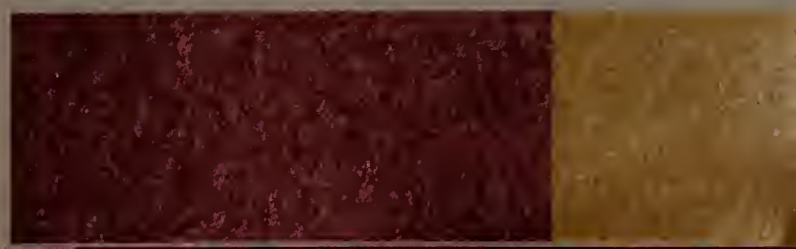
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In its first action against an electronic brokerage, the Securities and Exchange Commission censured Datek Online Brokerage Services Corp. for allegedly misusing \$43 million in customer funds to cover trades by other customers. The Iselin, N.J.-based brokerage will also pay a \$50,000 fine.

GE Capital Lands \$6B Outsourcing Deal

Tech Data Corp. today announced a three-year, \$6 billion outsourcing deal with GE Capital IT Solutions. The Clearwater, Fla.-based distributor of technology-related products and services said the agreement covers information technology procurement, logistics services and server configuration and assembly.

HP Slashes Prices On NetServers, PCs

Hewlett-Packard Co. has cut prices by up to 25% on its Intel-based NetServer systems, Brio business PCs, Vectra corporate PCs and Kayak PC workstations. The move came as Intel Corp. released its newest 550-MHz Pentium III processors.

Short Takes

Denver-based J. D. EDWARDS & CO. last week announced an \$80 million deal to buy NUMETRIX LTD., a Toronto-based maker of supply-chain planning software that works via the Internet. . . . LAWSON SOFTWARE in Minneapolis will be the latest company to enter the enterprise portal market tomorrow when it launches the Lawson Enterprise Portal. . . . PEOPLESOFT INC. said it plans to ship an online storefront application based on MICROSOFT CORP.'s Site Server 3.0 this summer. . . . IBM last week began to ship a major new release of the OS/400 operating system - Version 4 Release 4. . . . A recent report from INTERNATIONAL DATA CORP. in Framingham, Mass., said the number of billion-dollar outsourcing deals doubled from 1997 to 1998. U.S. contracts accounted for \$36 billion, or 63%, of outsourcing spending worldwide.

CEOs SEE GATES' VISION OF FUTURE

Digital Dashboard, e-paper, collaboration software highlight Microsoft summit

BY SHARON GAUDIN
REDMOND, WASH.

CORPORATE executives attending Microsoft Corp.'s third-annual CEO Summit here last week were intrigued by Bill Gates' vision of how advancing technology will keep their employees and their companies better connected — within two to five years.

"Information technology isn't about technology," said Jacques Nasser, president and CEO of Ford Motor Co. "Technology is about how you run a business. It is integral to what we do as CEOs."

But some industry watchers said Microsoft is focusing on the wrong things. They said instead of gadgets and more software, companies need reliable systems.

Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass., said Gates is looking in the wrong direction. "All this nice stuff he talked about is window dressing," Kusnetzky said. "It's intriguing, but it's not original thinking. Lucent [Technologies Inc.], CallStream [Communications Inc.], Lotus [Development Corp.] — they're all working on this stuff. And what's more important are systems that are always up. That would have been a better story to tell."

Gates never categorized those technology tools as new innovations. He simply used them to color in his picture of the office of the future.

Microsoft courted a little more than 100 CEOs of major international companies last week at its Redmond campus. Gates kicked off the two-day gathering with a keynote address focused on the gadgets and software he said will transform the way employees stay informed and work together.

Among the technologies that Gates touted as the business tools of the future were

Digital Dashboard, which offers individual portals of business and personal information; electronic paper; online collaboration software; and integrated online access to e-mail and voice mail.

"Employees have good ideas and customers offer good feed-

back, but a lot of that doesn't come together," Gates said during his speech. "People don't know each other. They don't trust each other. . . . But we can't always have face-to-face meetings. We have to make their communications just as good."

Gates said most of the technologies he was touting can be built now or within the next few years using Microsoft software like Exchange or Outlook.



MICROSOFT CHAIRMAN and CEO Bill Gates sits with Summit members, from left, Paul O'Neill, CEO, Alcoa; Martha Stewart, CEO, Martha Stewart Living Omnimedia; Michael Dell, CEO, Dell Computer Corp.; Gates; Jacques Nasser, CEO, Ford Motor Co.; Larry Bossidy, CEO, Allied Signal Inc.; and Jeff Raikes, group vice president, sales and support, Microsoft

DIGITAL PHOTOGRAPH ASSOCIATED PRESS

Digital Dashboard, for example, is a customized intranet site for each employee using Outlook. It was designed to offer a single point of contact for information, such as real-time stock quotes, news bulletins, sales figures and traffic reports. Jeff Raikes, Microsoft's group vice president of sales and support, said the pages can be built with Outlook now but he expects Microsoft will release templates or wizards to make it easier. No time frame was given.

Martha Stewart, chairwoman and CEO of Martha Stewart Living Omnimedia LLC, said she's looking forward to using Digital Dashboard, along with advanced videoconferencing and integrated e-mail and voice mail.

"Since I have to be in about five places at one time, I'd love to be more connected to everything very easily," said the guru of media and home decor. But Isaac Applbaum, CEO of Concorde Solutions Inc., a Concord, Calif.-based subsidiary of Bank of America, said he's concerned about putting too much information in one place.

"It's the difference between 'cool' and productive," said Applbaum, who didn't attend the summit. "There's a fine line between power and distraction." ▀

Transaction Loads Sack EBay Hardware

Service blips may be linked to Sun server

BY JAIKUMAR VIJAYAN

A series of hardware-related service interruptions at eBay Inc. in the past few months highlights the continuing challenges users and system vendors must overcome to ensure constant system uptime in the face of ever-increasing transaction loads.

Since January, eBay's online auction service has suffered more than 20 hours of unplanned downtime — including a two-hour disruption last week. In the latest incident, hardware wasn't to blame.

According to eBay's bulletin board, many earlier incidents, including a five-hour outage in May, were caused by problems relating to Sun Microsystems Inc.'s popular E10000 Unix enterprise server, touted by the

company as an ideal platform for hosting Web applications.

Problems have ranged from failed memory and system boards to I/O subsystem problems. EBay's problems highlight the challenges involved in keeping servers running continuously in a fast-growing, extremely volatile environment, said Jonathan Eunice, an analyst at Illuminata Inc., a consultancy in Nashua, N.H.

Other sites have faced similar problems. Schwab.com, for instance, suffered four server outages in two months this year. "The Web environment introduces a tremendous amount of uncertainty about when workloads will peak," Eunice said.

In eBay's case, the problems are partly the result of having

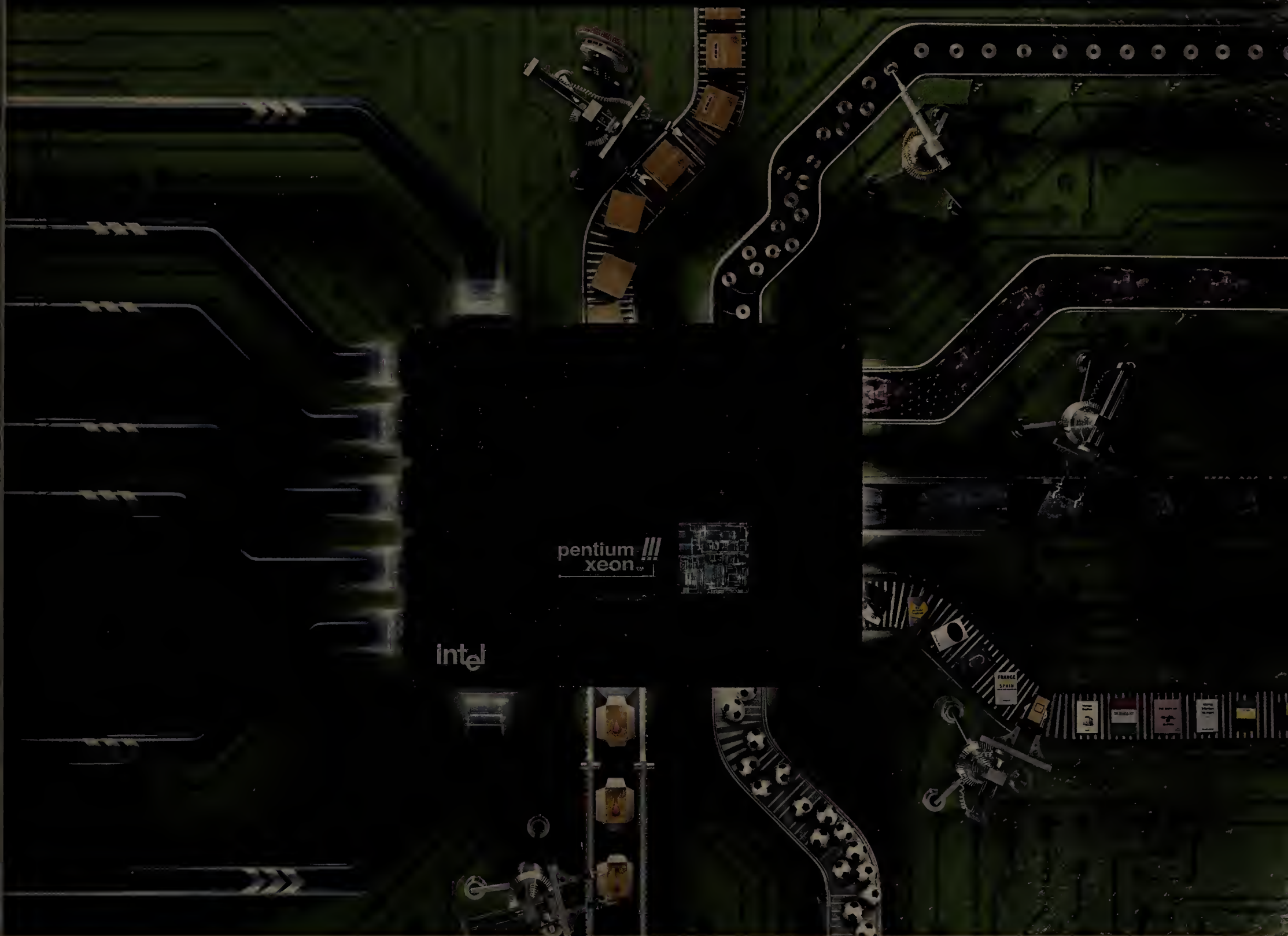
to constantly add things like processors, memory and new servers to handle the company's fast-growing business, said Shahin Kahn, marketing director of Sun's E10000 server business in Beaverton, Ore.

Ebay now has 3.8 million registered users and more than 1.9 million items for sale — compared with 1.2 million users and 1 million items in December.

Unlike the data center, where vendors and customers typically have time to fine-tune large, new systems before putting them into production environments, online businesses like eBay's don't offer that luxury, resulting at times in lowered reliability, Khan said.

Ebay spokesman Kevin Purseglove last week declined to comment on the specific problems relating to Sun equipment. ▀

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Linux Gains Development Tools in Bid For Expanded Usage

BY DAVID ORENSTEIN
RALEIGH, N.C.

A torrent of commercial application development tools is

becoming available for Linux. But users said they aren't yet convinced that elaborate enterprise applications belong on

the platform. And they said free tools fit the bill for smaller jobs.

Several software makers an-

nounced development tools last week at Linux Expo here, including Fujitsu Software Corp. in San Jose, which said

its C/C++ and Fortran tools will be available for Linux June 30, and San Jose-based BEA Systems Inc., which said its Web Logic application server and Tuxedo transaction manager is shipping now.

Such announcements, designed to make mission-critical distributed applications available on Linux, build upon ones made earlier this year, including Inprise Corp.'s pledge last month to make the popular JBuilder 3 Java tool available on Linux by the end of the year.

But most users aren't yet using Linux to run enterprise-scale applications, which require expensive middleware and complex technologies such as Enterprise JavaBeans, said analyst George Weiss at Gartner Group Inc. in Stamford, Conn.

The widespread availability of popular application development tool releases will make that possible when users decide to make the leap, he said.

Best Value: Single App

Matthew Kromer, a Web infrastructure developer at a major automobile maker and a member of the Linux Metro Detroit users group, said Linux's nearly free price makes it most valuable in environments where many low-end PC servers are combined to run a simple application.

For mission-critical environments where expensive middleware such as Tuxedo is used, the proportionally lower savings from using Linux vs. a more scalable commercial operating system is less attractive.

But Kromer said he would like to see a graphical user interface (GUI) development tool for Linux to help developers prototype applications.

Among the GUI tools for Linux are offerings such as BX Pro from Integrated Computer Solutions Inc. in Cambridge, Mass. Open-source tools are also available.

A webmaster at the American Red Cross, based in Falls Church, Va., who requested anonymity, added that as Linux GUIs improve, visual development will become more feasible and important.

But for development projects in Linux, the webmaster said he has been able to use the myriad free development tools and compilers that are often supplied with Linux versions. ■

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Palm VII Seen as Consumer Net Device

Users are wary about connecting it to server inside firewall

BY MATT HAMBLIN

The Palm VII, a version of the popular handheld device that's geared to wireless connectivity, debuts today — but information technology managers are wary of connecting it to their servers.

The new Palm is the latest in a series of announcements that give IT managers more wireless options for connecting mobile workers to headquarters and the Internet.

The Palm VII will provide e-mail and grab information from more than 20 Web sites through Palm.Net, a wireless communications service using Mobitex technology and running on the BellSouth Corp. wireless data network. The concept was announced last December by Palm Computing Inc. in Santa Clara, Calif., a subsidiary of 3Com Corp. [CW, Dec. 7].

Palm.Net access will begin in the New York metropolitan area; nationwide availability will come later in the year. The first units are expected to sell for \$599, with monthly wireless access charges ranging from \$9.99 to \$24.99, Palm said.

Security Concerns

The traditional PalmPilot and its sister devices are certainly popular, with more than 2 million sold. But IT managers are concerned that the Palm VII will require connections to a corporate server outside the firewall, which raises security risks, users and analysts said.

"What's the point of having a firewall if you aren't using it?" wondered Luis Ruacho, network manager at Yasaki North America Chrysler Business Unit in El Paso, Texas.

Figuring out how to connect the Palm VII server to data inside the firewall "sounds like a lot of work, and that would make it difficult," added Mark Higgins, director of IS at Sea Pines Co., a resort and developer in Hilton Head, S.C.

But Ruacho said the "Web

clipping" feature of the Palm VII, even at \$25 per month, would be attractive to executives who need Internet access.

Meanwhile, an Oracle Corp. official said in an interview last week that Oracle software, code-named Panama and due later this year, will help corporations simplify access to data from Palm VII and other wireless devices through a com-

pany firewall. "Right now, Palm VII is targeted at consumers, but we're working with Palm to bring it into the enterprise," said Denise Lahey, vice president of mobile and embedded products at Oracle (see story, page 20).

But analyst Matthew Nordan at Forrester Research Inc. in Cambridge, Mass., described Panama as little more than va-

IBM, ORACLE SET SIGHTS ON MOBILE CONNECTIVITY

Vendors look to tap Sybase's market niche

BY STEWART DECK

IBM AND ORACLE CORP. separately announced last week mobile databases that were designed to improve database connectivity for traveling employees and executives.

Both companies are trying to chip into Sybase Inc.'s early lead in the mobile database niche.

IBM has begun to beta-test its new DB2 Universal Database Satellite Edition — designed for large-scale laptop deployments — and DB2 Everywhere for Windows CE and PalmOS.

DB2 Everywhere has a 50K-byte footprint, requires 6K bytes of memory and was designed for handheld users who need to synchronize their data with data on enterprise

servers. It works with IBM's Mobile Connect synchronization server.

Oracle announced that the latest edition of its database for mobile users, Oracle8i Lite, will ship next month with several updates.

The product will include Oracle Lite, a small, Java-enabled database built for laptops and handhelds; Web-to-Go, a deployment and management component; and iConnect, an architecture for bidirectional synchronization of data and applications between mobile devices and database servers.

A Linux version of Oracle8i Lite is also in development, as is an edition of the database designed for small groups of up to 10 end users that Oracle said will come out sometime in

Recent Handheld Maneuvers

COMPANY	ANNOUNCEMENT
IBM	Wireless networking products based on the Advanced Infrared standard
Riverbed Technologies Inc.	Mobile Device Management Center, software that administers handhelds
3Com Corp.	Extension of Transcend network management to Palm Computing platform

porware so far. "Palm VII would be a fantastic product idea if you could link to data inside the firewall and if we had a better network to work

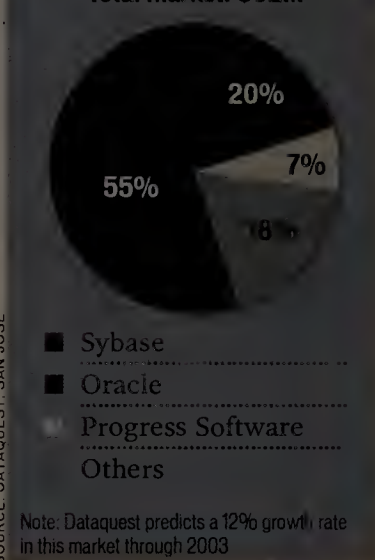
with," he said. "Mobitex is excruciatingly slow."

Mobitex runs at about 9K bit/sec., half the rate of cellular networks. ▀

Mobility Slices

Mobile database market share, 1998:

Total market: \$52M



the second half of this year.

Shelly Rosenthal, vice president of information technology at Newcourt Credit Group Inc. in Parsippany, N.J., said

small-footprint databases have been the key to keeping his national sales force fast and more responsive to market changes and customers. Newcourt's mobile users all carry an Oracle Lite version of the company's loan origination database with them during sales calls.

"This has made our response time [with customers] much faster because we aren't tied to phone lines for every sales call," Rosenthal said. "There are practically no training issues" because users know the database, he added.

"Sybase has led the march into this quickly growing space," said Carl Olofson, an analyst at International Data Corp. in Framingham, Mass. "All of these announcements are about people who carry small devices not having to worry about the linkage between the handheld device and the base environment." ▀

Emperor Virus Targets DOS-Based PC Files

BY ANN HARRISON

A company that develops antivirus products said it has discovered a more contagious and destructive clone of the Chernobyl virus which can bypass virus protection programs. But a rival software vendor said that the virus, known as Emperor, can't affect many users because it affects only DOS-

based machines and COM and EXE files.

According to Ken Peer, president of Central Command Inc. in Medina, Ohio, Emperor changes each time it infects a system, making it difficult for antivirus programs to detect it.

Although DOS accounts for 2% of the operating systems market, according to Interna-

tional Data Corp. in Framingham, Mass., DOS files on other PCs could be vulnerable.

The Emperor virus, about 6K bytes in size, overwrites the master boot record of the hard drive and the boot sector on floppy diskettes. It corrupts the Flash BIOS, preventing the user from booting up the machine. It's activated between 5

a.m. and 10 p.m. if the computer is turned on. Peer said Emperor hasn't yet infected a large number of users.

Sal Viveros, a marketing manager at Network Associates Inc. in Santa Clara, Calif., agreed that Emperor can be dangerous to PCs it infects. Viveros noted that Emperor is one of 300 viruses that the company sees each month, and that it affects only DOS programs and hasn't yet been observed outside laboratories. ▀

MORE THIS ISSUE

For a review of the Palm VII, see page 66.

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BRIEFS

Study: 6M Online Shoppers Cry Fraud

A study released last week by the Washington-based National Consumers League shows that 6 million e-commerce customers believe they have been victims of online fraud or misuse of credit-card information. Despite their concerns, respondents said they still support expanded electronic banking and plan to increase their purchasing on the Internet. According to the study, 42% of respondents use the Net to gather information about products and services, and 24% purchase online.

Hitachi Bolsters CMOS

Hitachi Data Systems last week boosted its family of CMOS mainframes with the new P9 Pilot Series. The system is based on the same processor technology as IBM's recently announced Generation 6 mainframes and can perform at a peak 1,700 MIPS when configured with the maximum 13 processors.

Web Tool to Work With Win 2000

Elemental Software in Carlsbad, Calif., said its Drumbeat 2000 Web site development tool will support new Microsoft Corp. technologies due with Windows 2000, including the object framework COM+, Active Directory and Extensible Markup Language. The intent is to let developers more quickly build more complicated Web sites with database and personalization capabilities.

Short Takes

GTE ENTERPRISE SOLUTIONS in Washington has launched a common platform that allows real estate organizations to access the Multiple Listing Service database over the Internet. . . . SERVICEWARE INC. in Oakmont, Pa., later this week will launch rightanswers.com, an Internet-based knowledge base for PC help desks that includes support information from MICROSOFT, APPLE COMPUTER INC. and NOVELL INC., among others. . . . Internet service provider PSINET INC. is linking up with e-mail software developer SOFTWARE.COM INC. to provide outsourced messaging services.

LOTUS EYES STANDARD FOR ONLINE LEARNING

Positions LearningSpace as a de facto platform, plans to ship Version 3.0 in July

BY DOMINIQUE DECKMYN

LOTUS DEVELOPMENT Corp. today will announce plans to establish its LearningSpace software as a de facto standard for distributed learning. Users and analysts gave the company a good chance of succeeding.

The Cambridge, Mass., company said it will offer a complete line of online courseware developed by third parties for the forthcoming LearningSpace 3.0 software. The courses will be available starting in July, but pricing hasn't been set yet.

LearningSpace 3.0, set to ship by the end of the current quarter, will combine Lotus' own asynchronous learning platform with the real-time collaboration features of DataBeam Learning Server, a technology that Lotus acquired last year.

The prospect of having a sin-

gle, Web-based platform and a single user interface for a wide range of training programs is appealing to users such as Frank Taylor, manager of training and quality assurance at Astra Pharmaceuticals LP.

Approximately 1,000 people at the company's manufacturing site in Westboro, Mass., must be trained regularly in rigorous manufacturing practices to comply with government regulations. The company is beta-testing manufacturing courseware developed for the LearningSpace platform, and if that project is successful, Astra hopes to use the same platform for other training packages.

"The more we standardize [on one learning platform], the easier it becomes for the user," Taylor said.

Al Gordon, program manager at Siemens Virtual University in Pembroke Pines, Fla., the computer-based training divi-

sion of Siemens Information and Communication Networks Inc., has been using DataBeam's real-time capabilities for three years. "To be able to put all this together in a cohesive environment, with some management [capability], could be very valuable," he said.

Saved \$1M

In its second year of using the DataBeam product, Siemens Virtual University saved more than \$1 million in travel expenses, Gordon said.

A groupware analyst was also optimistic about Lotus' distributed learning ambitions. "Lotus has been the leader in teamwork-oriented software for many years, and just because of their size, I don't expect this to fail," said Lewis Ward, a research associate at Collaborative Strategies LLC, a San Francisco-based consulting firm. ▀

MOREONLINE

For groupware resources, visit our Web site. www.computerworld.com/more

IBM Puts Tivoli in the Management Seat

New mainframes will run Tivoli products

BY SAMI LAIS
NASHVILLE

It's a wired, wired world — and everything will connect to, and get managed from, Tivoli Systems Inc. systems management software.

So says IBM Chairman Louis V. Gerstner, making a rare public appearance at last week's Planet Tivoli user conference. Gerstner said that, starting next month, IBM's latest and biggest mainframes, Generation 6, would ship ready to run Tivoli's software.

That's the high end of what Gerstner said will be a "pervasive computing" model, in which the range of devices connected via a network and managed by Tivoli software will rise exponentially.

IBM will build the technol-

ogy to power devices — software, chips and servers — while Tivoli technology will play a key role in managing it all, he said.

30 Products

Austin, Texas-based Tivoli announced that about 30 additional software products have been integrated with its management suites. That means products — including IBM's DB2 database, Novell Inc.'s ManageWise, Cisco Systems Inc.'s Cisco Works 2000, 3Com Corp.'s Enterprise Manager and Symantec Corp.'s Norton AntiVirus software — are shipping ready to work with Tivoli's Enterprise or NetView packages.

Tivoli, which was acquired by IBM four years ago, also

used the conference to announce management tool upgrades and service initiatives, including the following:

■ Service Desk 6.0, designed to help systems managers control service levels to end users. The update adds the ability to support multiple system customers while monitoring system problems, assets, changes and defects through a common database.

■ The Customer Service Assurance initiative, which uses the Enterprise suite and was designed to help information technology managers automate processes such as managing system security, storage and asset management.

■ Four new Decision Support Discover Guides, designed to let IT organizations plan for future system capacity and meet system service-level agreements in their companies. ▀

Continued from page 1

Windows 2000

automatically switch to the last available node and remain operational.

■ Uptime, a tool designed to track and report when servers go down and how long they remain down.

Microsoft's strength lies in branch office or departmental servers. Gambier said these tools and software extensions should help Windows 2000 enter the enterprise where scalability, reliability and interoperability are key.

And Microsoft also is expected to tout interoperability on Tuesday, when it releases a list of software vendors that are building applications using Microsoft's Distributed Network Architecture (DNA). The architecture, which is based on Windows APIs, is geared at building Web- and Windows-based applications.

Out of Character

Jigish Avalani, Microsoft's group manager for Windows DNA, is touting DNA as a way to integrate Windows-based applications with other platforms, a move that seems out of character for a company known for being highly proprietary. Avalani said the applications can access other platforms using integrated middleware, specifically a bridge between Microsoft's proprietary Component Object Model and the cross-platform, industry-standard Component Object Request Broker Architecture. The bridge has long been in the works.

"Using that bridge, a DNA-based application could talk to an Oracle database or a mainframe," Avalani said. "It's one of the elements that we're using for the enterprise."

But many corporate IT groups aren't interested in seeing Microsoft team up with various small software companies to provide middleware between its software and that of other companies.

"They would love to have a one-stop shop," said Josh Walker, an analyst at Forrester Research Inc. in Cambridge, Mass. "Microsoft would do well by those folks to provide middleware itself, but it hasn't." ▀

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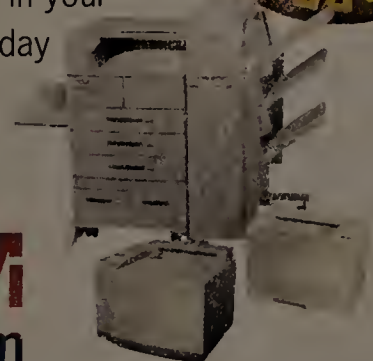


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Continued from page 1

3-D Images

in-store experiences.

For example, at www.sharperimage.com, you can pop open a CD player to get a feel for how it ejects discs.

Go to www.landsend.com, type in your measurements, and you can create your own personalized apparel model from Lands' End Inc.

It's cool. It's fun. And according to retail experts, it's seen as one of the most promising ways to convert online browsers to online buyers.

"If you get them past the point where they need to see [a product] in person, they're much more likely to buy," said Tom Fornoff, a vice president at Intelliquist Information Group, an e-commerce market research firm in Austin, Texas.

That's important, because of the 32% of Americans who shop online, only about 11% actually buy, Fornoff said.

Giving customers the power to spin, zoom in on and listen to products helps keep shoppers online longer, which increases their likelihood of clicking on the buy button, retailers said.

The Sharper Image, an upscale electronics and gadgets retailer, features 25 of its top-selling products in an enhanced 3-D area of its Web site. The 3-D portfolio was created by Viewpoint Digital, a Marina Del Rey, Calif., services company that specializes in streaming technology and interactive 3-D imaging.

Online, the company's gadgets spin, whirl, beep and buzz much the way they would for

an in-store shopper.

"It keeps users engaged, so it keeps our site sticky. We've already turned browsers into buyers, and that's all that matters," said Meredith Medland, director of Internet marketing at the San Francisco company.

In the Web world, stickiness refers to a site's ability to maintain users' interest and keep them coming back. It's what Ticketmaster Online hopes to attain by letting users see where their seats are for a given concert or sporting event.

The Los Angeles-based ticket agency is also using Engage Technology's software to collect user data and preferences to create personalized Web pages for regular customers. The system also notifies them of events of interest indicated in their profile. Aretha Franklin fans, for example, would receive e-mail reminders in advance of the singer's scheduled local concert dates.

The Catch

But being cool and having fun online don't come cheap.

The cost of creating 3-D images that shoppers can spin and twirl ranges from \$3,500 to \$10,000 per image, said Steve Wollock, director of field marketing at Viewpoint Digital.

Another potential downside of the new imaging is the time it can take some users to download complex, interactive 3-D images. At Ticketmaster, for example, it can take customers using a 28.8K bit/sec. modem three to five minutes to download certain images.

But Ticketmaster has also created a software plug-in for viewing that users need download only once, said Josh Zarov, ticketing product manager.

"[Advances in] technology move quickly enough that the barriers drop," Zarov said.

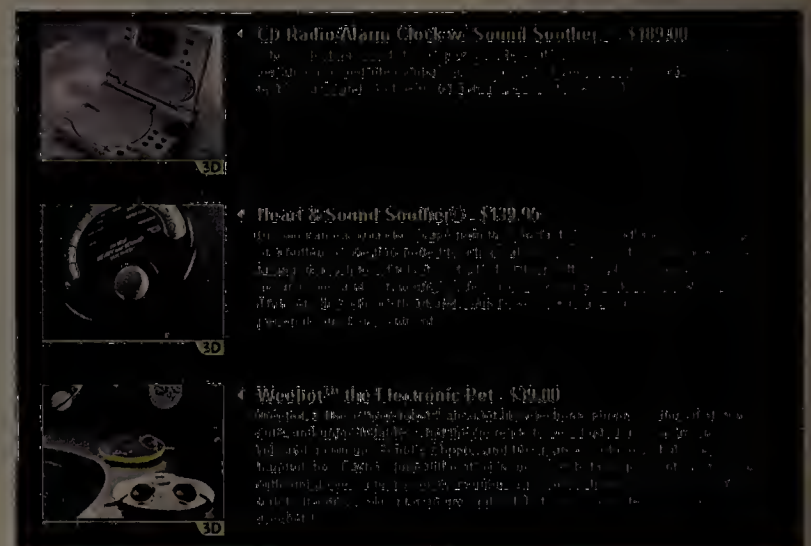
At The Sharper Image, Medland figures she more than makes up the cost of the new 3-D technology on greater publicity and increased visibility for the company's Web site.

"The PR value alone of new technologies can increase sales and drive results, even though you might not see those results the next day," she said. ▀

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AT THE SHARPER IMAGE'S Web site, you can manipulate objects like CD players to get a feel for how they work

Product Development Tool Gets Revamped With Java

IpTeam integrates suppliers, contractors

BY DOMINIQUE DECKMYN

NexPrise today will announce an overhaul of its flagship product, a Web-based collaborative engineering tool used by product design teams at The Boeing Co.'s Rocketdyne unit, Raytheon Co. and Ford Motor Co.

NexPrise Inc. in Santa Clara, Calif., was founded in 1997 to market technology developed at Lockheed Martin Corp. with funding from the Defense Advanced Research Projects Agency. Its ipTeam software is already being used by a small number of customers, most of whom were also involved in the early stages of the product's development.

IpTeam 3.0, which will be officially launched today and will ship next month, will be the first version to be marketed broadly, said President and CEO Ram Sriram. The release has been rewritten in Java and features a new decision-building tool that automates and documents the making of engineering decisions.

The software will be priced at about \$90,000 for a 100-user configuration and will also be rented on a per-user basis.

Development Cycle

A key feature of the product is that it integrates suppliers and contractors into the product development cycle, ac-

cording to analysts and users. For instance, it automates the bidding procedure for suppliers. "No one has actually targeted this issue before," said Wayne Collier, president of engineering, manufacturing and design at technology research firm D. H. Brown Associates Inc. in Port Chester, N.Y.

Roger Moorhead, materials program manager at tactical missile manufacturer Lockheed Martin Vought, said he estimates this feature of ipTeam alone will help the company shave 10% off procurement costs.

The company has been piloting the software (which was originally developed at Lockheed Martin) with about 100 users and is now rolling it out to more than 850.

Though collaborative engineering is a relatively new niche, NexPrise's ipTeam already faces competition from several recent entrants such as Centric Engineering Systems Inc. in Sunnyvale, Calif., and Framework Technologies Corp. in Burlington, Mass.

NexPrise must also increasingly compete with product data management tools, general-purpose groupware products such as Lotus Development Corp.'s Notes and certain enterprise resource planning applications.

"The fact that they have chosen to target a market that they know a lot about makes a lot of sense," said Mark Levitt, an analyst at market research firm International Data Corp. in Framingham, Mass. ▀

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Government Documents for Free; Net Advertising, Digital Economy Get Scrutiny

A U.S. Department of Commerce agency last week opened what it thought would be a fee-based search engine for finding government documents. But just hours after the National Technical Information Service (NTIS) and private partner Northern Light Technology LLC launched the engine, it went from fee to free.

The Clinton administration said it wanted to review the service to ensure it wasn't violating federal information access policies, said Renee Edwards, an NTIS spokeswoman.

The search engine (www.usgovsearch.com) will be free until June 1, according to a notice placed

on the Web site. But Edwards said the search engine may remain free for a month or longer while the review takes place.

The sponsors want to charge users fees based on a variable scale, ranging from \$15 for one-day access to \$8,000 annually for corporate accounts of up to 50 people.

The U.S. Federal Trade Commission (FTC), trying to put more enforcement focus on Web advertising, last week created a nine-member Internet advertising practices group, said Jodie Bernstein, director of the agency's bureau of consumer protection.

The group was unveiled just days after Dell Computer Corp. and Micron Electronics Inc. settled FTC charges that their computer lease advertisements violated federal laws. The FTC said lease terms were either inconspicuous or unreadable on the companies' Web sites. The settlement calls for readable text.

The Department of Commerce will examine the impact of the "digital economy" on U.S. economic growth at a conference this week in Washington. The intent is to give retailers, manufacturers and investors better statistics on e-commerce.

— Patrick Thibodeau

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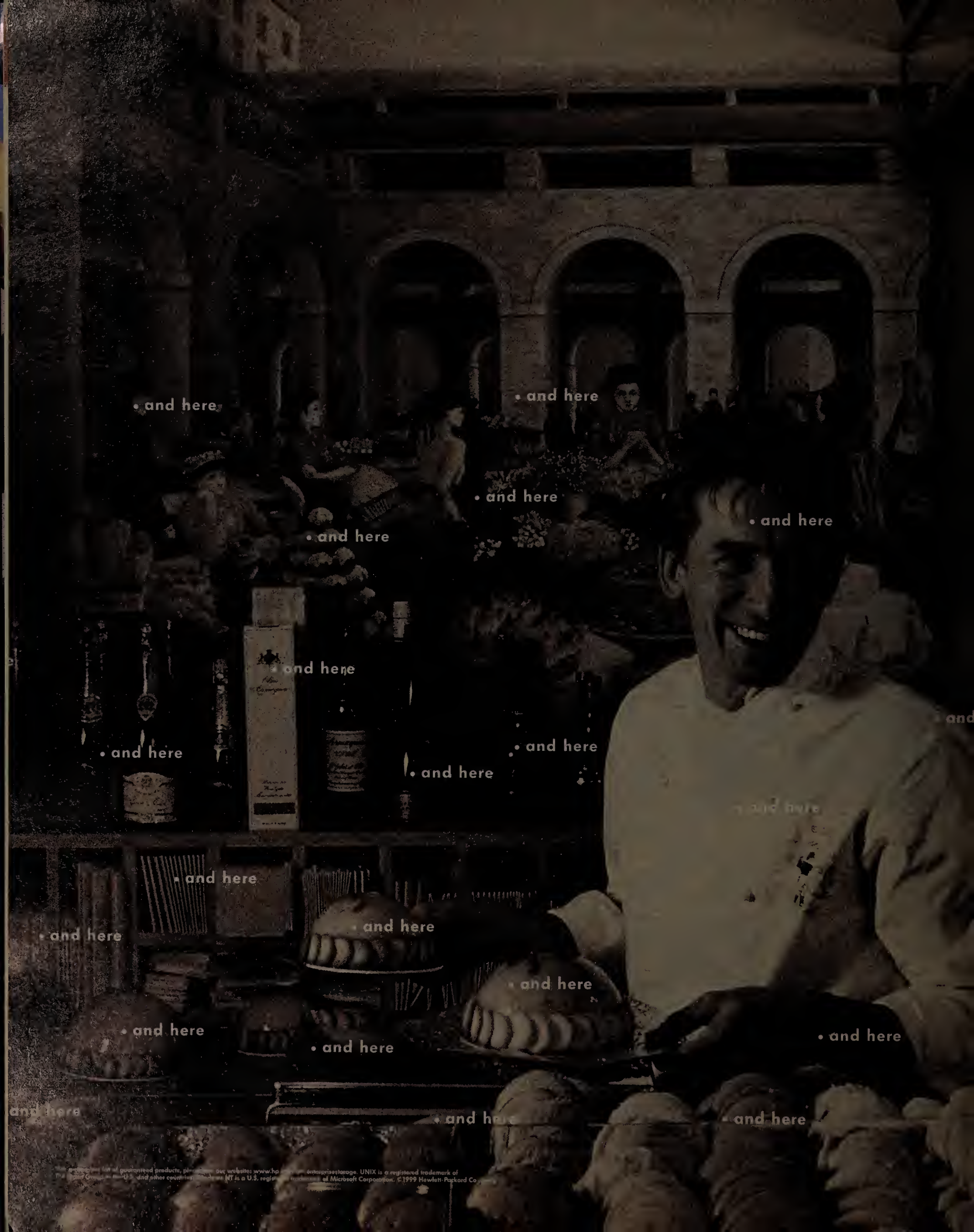
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HANDHELDS TAKE ON CORPORATE FUNCTIONS

Pioneering IT departments deploy PDAs for warehouse pickers, stock traders

BY MATT HAMBLÉN

BUYING A \$3 beer on a flight sure would be easier for weary travelers if flight attendants took credit cards and gave receipts. No more fumbling for exact change.

American Airlines is thinking along the same lines. It wants to arm flight attendants with handheld computers to record liquor sales, capture credit-card information and print receipts.

Eventually, flight personnel could use handhelds to sell items other than liquor to thousands of travelers daily and then file end-of-shift reports, perhaps through a wireless network, said Gregory Wood, technology planner at American in Dallas.

Using personal digital assistants (PDA) would save flight attendants time and improve sales, Wood said. "American Airlines has quite a few programs under consideration for PDAs, but we have to look at the business case first," he said.

American's in-flight application is still on the drawing board, but a handful of other companies are preparing to connect hundreds of off-the-shelf PDAs to custom applications intended to cut costs or increase revenue.

The Northern Trust Co. in Chicago, for example, plans to link sales forces carrying handhelds to critical databases. And earlier this month, Federal Express Corp. in Memphis announced an agreement with AvantGo Inc. in San Mateo, Calif., to let handheld users track the status of their FedEx packages online.

In essence, PDAs are being seen as more than personal contact and calendar toys. Many companies are hoping to connect workers to sales databases and simple e-mail or to provide cheap ways to automate functions.

Handhelds are getting more serious roles for a variety of reasons: A wide selection of PDA models and vendors has emerged during the past 12 months, wireless network connections are getting cheaper, and the cost of a PDA may be 10% of the cost of a laptop computer. PDAs have limited capabilities, but sometimes end users don't need more.

"PDAs are becoming more important in the enterprise market because information technology is now able to develop mission-critical applications with them," said Gerry Purdy, an analyst at Mobile Insights Inc. in Mountain View, Calif. Tools for developing software for handhelds are on the market, and major database companies such as IBM, Sybase Inc. and Oracle Corp. are offering ways

to connect handhelds to corporate databases.

But heavy-duty business applications for PDAs are far from mainstream. Most corporate PDA projects are still in the pilot phase, and many companies won't talk about them for competitive reasons.

At Peapod Inc. in Skokie, Ill., PDAs already play a critical role. Last November, the online shopping service deployed about 300 PalmPilots from 3Com Corp. subsidiary Palm Computing Inc. for warehouse "pickers," who use them to fill grocery orders.

Cost is a big factor. "The PalmPilots benefit from consumer manufacturing, so they're cheap," said Peapod CIO John Furton. "It's been very successful."

Eventually, Furton said, Peapod may replace the paper used by delivery drivers with Palm-based handhelds, capturing signatures on-screen from customers at their homes.

The Bank of Montreal hopes to reach its several million cus-

tomers in North America with Web-based banking via handhelds connected to a wireless network, said Mark Dickelman, vice president of e-commerce at the bank's technology subsidiary Emfisys in Chicago.

A market test begins this summer to see which devices users prefer, starting with the Qualcomm Corp. pdQ cellular phone running the Palm Computing operating system. Similarly, Discover Brokerage in San Francisco has joined with Aether Technologies in Owings Mills, Md., to bring wireless stock trading to Palm and Windows CE devices starting in July.

For \$69 per month, users will have unlimited access to cellular services in most major cities to check pricing, get price alerts and make trades. Investors will need to buy a handheld and a wireless modem loaded with special software for a total of \$650.

The service is possible because handhelds have become smaller and cheaper and they integrate more functions, including wireless capability, said George Davis, Aether's chief operating officer. "Pricing is coming down, and services are getting better."

Robo-Trader

About 15 professional traders at the Chicago Mercantile Exchange (CME) also use handhelds for making real-time trades on futures and money markets.

By year's end, CME plans for hundreds of units to be in use on the two CME floors. That will let traders retain the traditional "open outcry" method as well as make wireless trades with other trading pits via the handheld devices, a CME spokesman said.

For instance, British pound trader Larry Goldstein has rigged a protective plastic cover over a Casio Computer Co. Cassiopeia handheld and attached it to one wrist. He uses a pen to input trades via custom software. "I'm a robo-trader," joked Goldstein as he showed off his strap-on electronic gear.

Sprint Takes Two

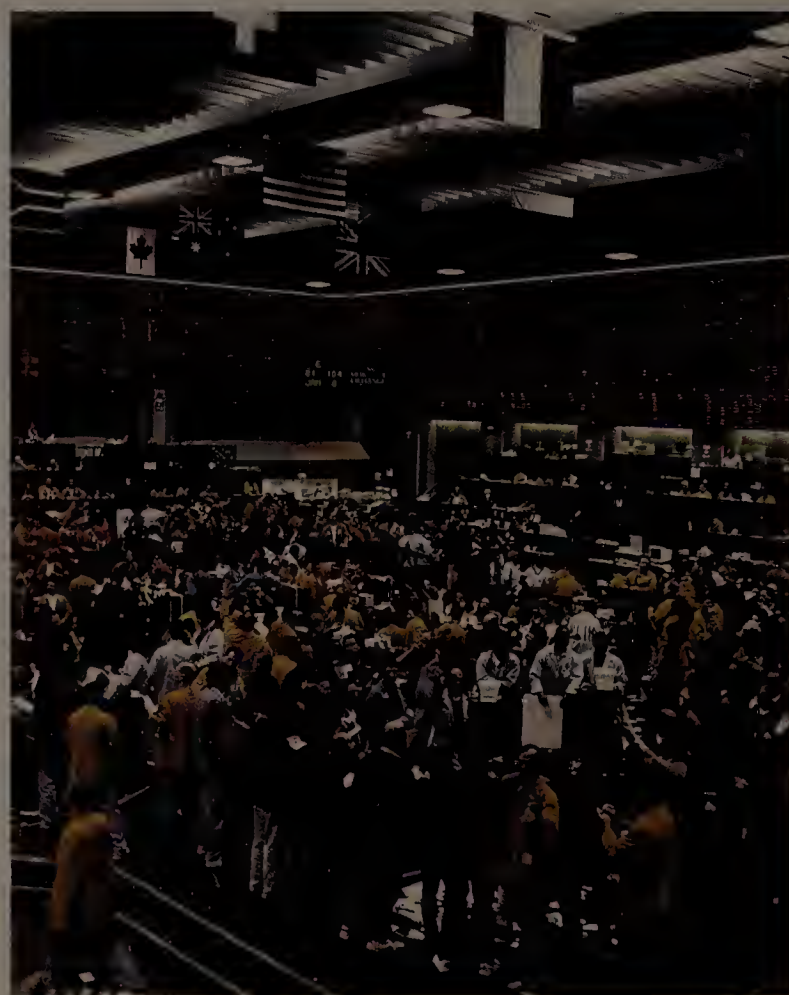
The proliferation of digital gadget can be a headache for IT staffs. So telecommunications giant Sprint Corp. recently decided to simplify the management of its handhelds by picking two PDAs that the company will pay for and support.

"People were bringing in all different kinds of PDAs and would call the help desk when they were losing synchronization software. [That] would sometimes screw up the desktop," said Mark Hopkins, a technical specialist at Sprint.

Sprint selected the Palm II and the Sharp Mobilon as its standard devices - and discourages employees from synchronizing with any other brands, Hopkins said. Employees shouldn't expect to get help desk support for any other handhelds, either, though there may be exceptions.

Sprint officials wouldn't say how many of the company's 68,000 employees will receive PDAs, but only those with heavy travel and meeting schedules will get them for free. - Matt Hamblén

**MOBILE
COMPUTING**



THE CHICAGO MERCANTILE EXCHANGE will deploy hundreds of PDAs to traders so they can be making wireless transactions in one trading pit as they're yelling in another

CME officials said traders are longing for the flexibility of using the handhelds in a wireless LAN so they can make more deals per day.

Other stock and futures exchanges are planning to deploy handhelds, too, in some cases using long-distance wireless networks for national and international trades.

But analysts say the emergence of corporate applications for handheld devices will require IT departments to learn about new topics such as PDA hardware platforms, synchronization software and wireless capabilities.

Analysts also warned IT managers not to expect PDAs to easily double as e-mail machines. Windows CE has some incompatibilities with other Windows operating systems that make it impossible to open some e-mail attachments, for example. Besides, it's a time-consuming chore to read a long e-mail message off a Palm device, analysts said.

"There are tons of downsides to using handhelds in companies, and first and foremost is that companies don't have applications that will run on them," said analyst Jack Gold at Meta Group Inc. in Boston. ▀

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RELIEF SUPPLIERS FACE CHALLENGE

Antiquated systems and few funds for IT hinder efforts to procure emergency items

BY STACY COLLETT

THE International Procurement Agency (IPA), can find 10,000 blankets made of 50% wool (as specified by the customer) from a manufacturer in India.

But when it comes to ordering or shipping the goods to refugee camps in the Balkans, the Netherlands-based company has to handle arrangements by fax and do shipping calculations and documentation by hand.

So goes the battle in bringing the lowest-priced supplies to disaster areas.

As the number of ethnic Albanians fleeing Kosovo for refugee camps climbed to 744,000 last week, government and humanitarian groups turned to a growing disaster-products industry for supplies.

These procurement companies specialize in locating and negotiating the lowest prices for blankets, generators, light-

ing towers and all-terrain vehicles and quickly delivering the items to refugee camps. But when managing their own complex supply chains and inventory, most procurement companies lack information technology solutions.

Officials said they can't afford the highly customized systems they require.

"We've spent a small fortune trying to customize our IT systems but haven't been successful," said Mike Ridenour, director of IPA's Canton, Ohio, office. The organization considered more-expensive enterprise resource planning systems, but "then you get to a point of diminishing returns," he said.

Tri-Med Ltd. in London developed its own load-planning software 13 years ago. But the system isn't year 2000-compliant. Tri-Med also uses a U.K.-based multicurrency accounting program called ICE. But director Peter Smith acknowledges it doesn't meet all of the

agency's needs. "At the end of the year, I need a total overhaul of the system," said Smith, adding that he will do most of the overhaul work.

Not all relief suppliers have outdated IT systems. Toyota Gibraltar, the Spanish unit of

Figueredo, marketing executive at Toyota Gibraltar. Its Web site offers product and shipment-tracking information in four languages.

IPA's Ridenour said the Internet is the most effective tool for communicating with vendors and relief agencies in Western Europe, where 45% of IPA's products originate. But fax machines are still needed for communicating with India, Pakistan and China, where 30% of its suppliers are based. IPA's Web site also lists products



Albanian refugees from Kosovo wait in line to collect food sent by the U.S. from NATO troops in a camp near Skopje, Macedonia

Toyota Motor Corp., supplies all-terrain vehicles to relief agencies and benefits from its parent company's systems.

The unit uses accounting and shipment-tracking systems similar to those at other Toyota facilities, said Darion

that are available.

Internet e-mail now accounts for 30% of Tri-Med's communications with suppliers, said Smith. That's up from 5% last year. The London-based procurement group doesn't have a Web site. ▀

For Locator Satellites, Year 2000 Arrives in August

Potential problems debated at hearing

BY PATRICK THIBODEAU
WASHINGTON

The satellites that make up the Global Positioning System (GPS) won't be affected by year 2000 problems. But the back-end systems that receive and process positioning data could fail if steps aren't taken to fix them, according to testimony at a recent congressional hearing. Furthermore, some ground-based systems could run into trouble during the so-called "end of the week"

rollover on Aug. 21. Despite its name, this is a first-time event for the GPS system since it began working in 1980.

GPS satellites don't use calendar dates but keep track of time by counting weeks. GPS started at week zero on Jan. 6, 1980, and at the end of the 1,024th week — Aug. 21 — the clocks will reset to zero. That reset may create problems for some land-based receivers, experts testified.

Originally a military system, GPS is now widely used in the commercial sector, especially in transportation for tracking corporate fleets and vessels to ensure timely deliveries. The

satellites also relay highly accurate timing information used to synchronize computer and telecommunications networks.

Representatives from the U.S. Department of Defense and the National Aeronautics

and Space Administration assured members of the House technology and science subcommittees, which jointly held the hearing, that they won't have GPS problems.

Commercial users will have to check their GPS equipment before the August rollover to ensure that they won't be affected. A software patch or chip replacement will fix most receivers. "There are just a few, very old sets that essentially won't be upgradable," said John Webster, a GPS consultant in Huntsville, Ala.

Timing errors "can lead to data loss and degradation and eventually to network disruption or even complete failures," testified Keith Rhodes, the technical director of the U.S. General Accounting Office's information management division at a hearing two weeks ago. ▀

Global Positioning System

THERE ARE 24 SATELLITES at fixed positions

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THE FIRST SATELLITE was launched in 1978. Defense agencies began using the system in 1980

Postal Service Revamps IT To Cut Costs

New projects on hold during Y2K fix

BY TOM DIEDERICH

The U.S. Postal Service is evaluating numerous technology projects — suspending some and axing others — to cut costs and ensure that the year 2000 issue won't hamper mail delivery come Jan. 1.

"We're kind of tightening our belts — individual managers have been asked to look into their own areas and determine where they can make cuts," said spokesman Norm Scherstrom. "And then we have a Y2K remediation effort going on, so we're not going to bring in any new systems."

The Postal Service has spent about \$600 million gearing up for 2000 in the past three years, employing an additional 2,000 people for Y2K issues, spokesman Mark Saunders said.

Saunders said the agency was acting like a private-sector business in cutting some projects and holding off on others, though he wouldn't name the targeted programs.

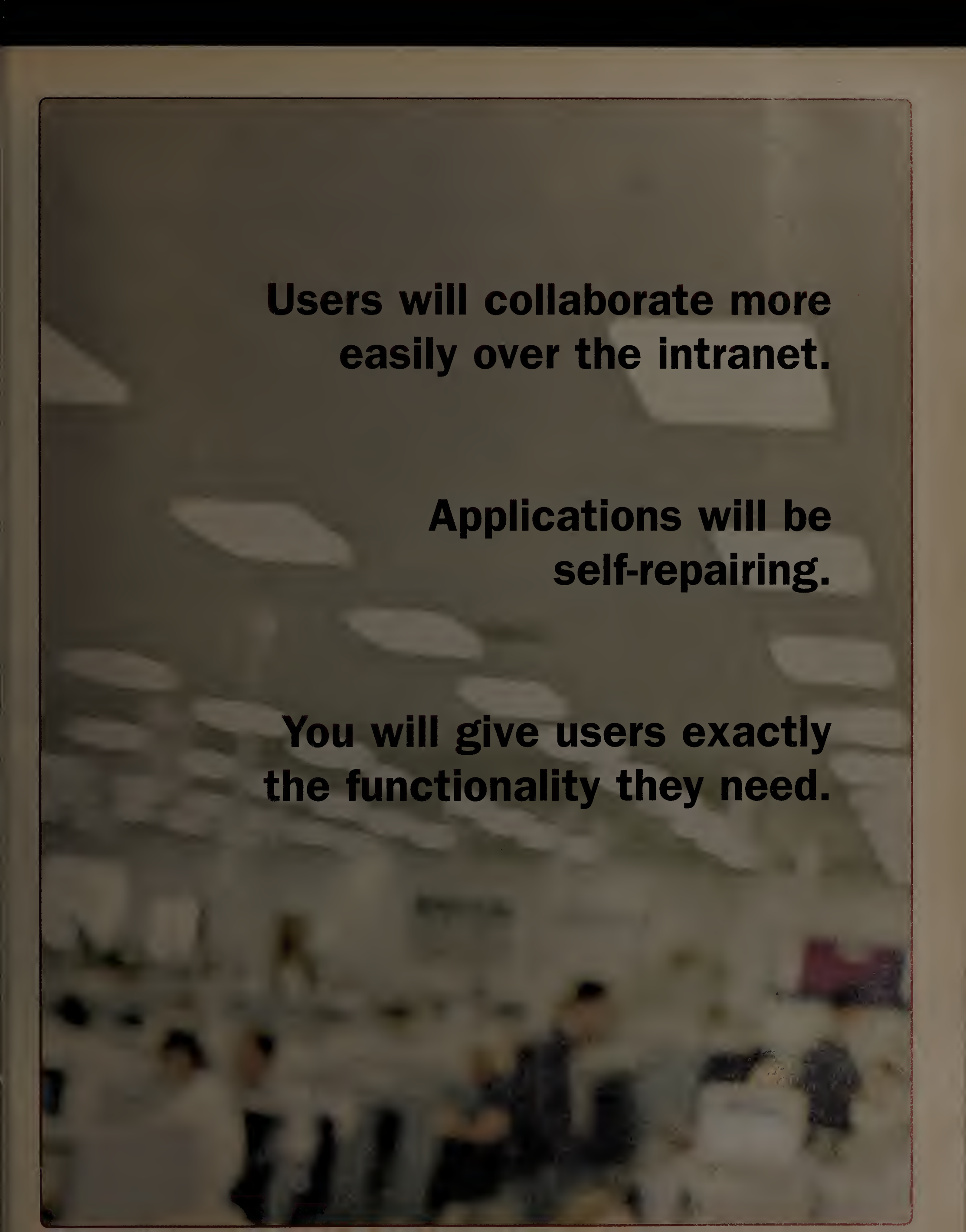
"We're focusing on mission-critical systems that involve mail processing, transportation, delivery," Saunders said. "Keeping the mail moving is the top priority."

Though the Postal Service wouldn't comment on specific cuts, one of its vendors did.

Officials at Electronic Clearing House Inc. said the Postal Service has suspended its electronic-money order processing pilot. The project, launched in 1995, was in the testing phase in Dallas, according to company spokeswoman Donna Camras.

"We were in the process of working on software enhancements, but now everything has been temporarily put on hold," Camras said. "They haven't given us any idea of how long the delay will be, but we know that they're still interested."

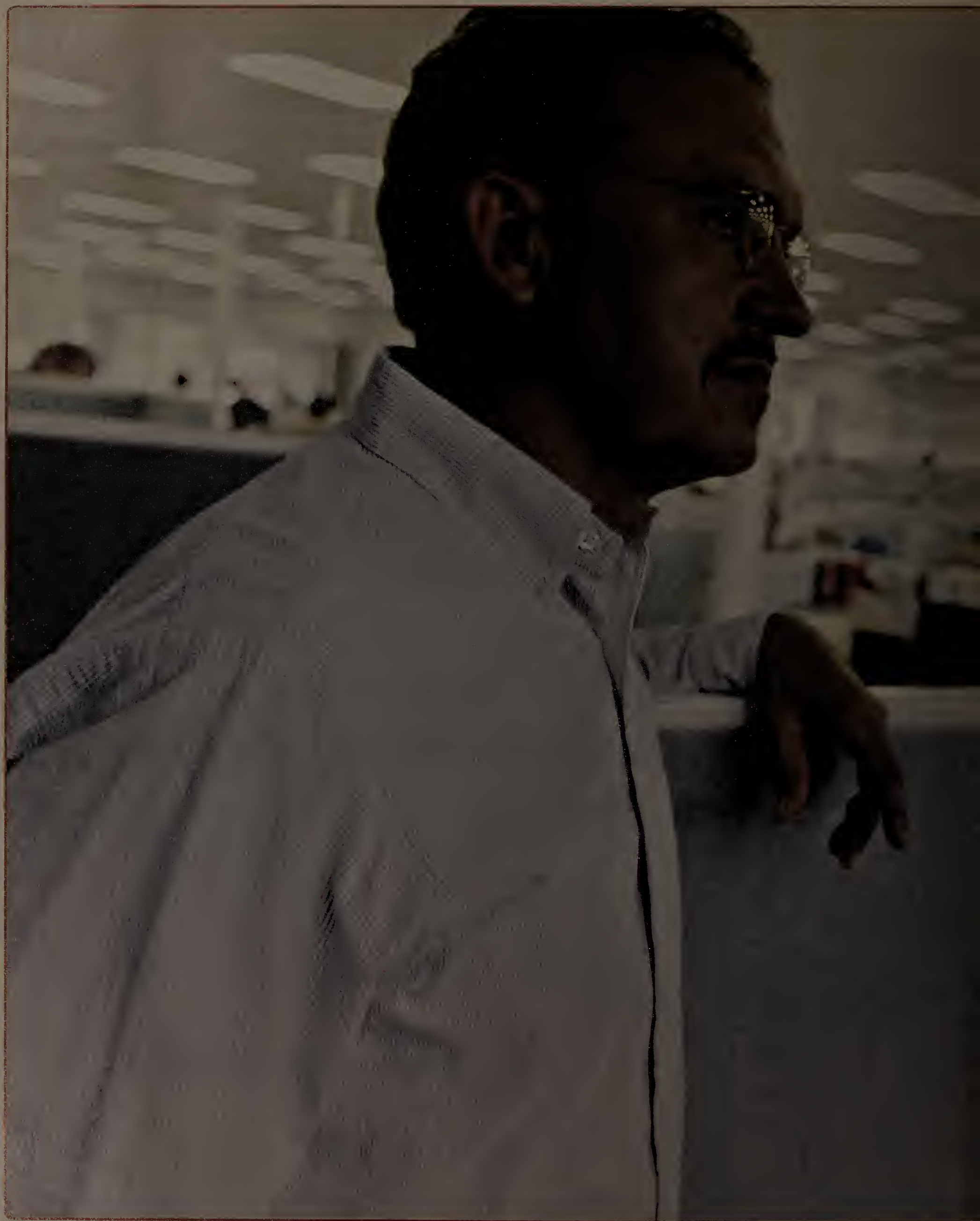
The Postal Service's Saunders said he couldn't confirm or deny that claim because the situation is "fluid." ▀



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US West, Global Crossing To Merge in \$37B+ Stock Swap

BY MATT HAMBLÉN

The latest megamerger in the telecommunications industry promises to offer more voice-

and data-network service options and perhaps more-responsive service for large business customers, analysts said.

US West Inc. in Denver, the smallest of the Baby Bells, announced it will merge with Global Crossing Ltd. in Hamil-

ton, Bermuda, in a stock swap worth more than \$37 billion.

For the merger to pass muster at the Federal Commu-

nications Commission, Global Crossing may need to sell off its long-distance voice and data business in US West's 14-state territory to preserve competition, analysts said.

Global Crossing is buying long-distance carrier Frontier Corp. in Rochester, N.Y., for \$11 billion. Frontier has a small number of long-distance customers in the US West region.

User firms in US West's local-service area could get a "preferred provider" option for less-expensive long-distance service from Frontier under the deal, but the new entity couldn't require customers to use Frontier, said analyst Melanie Posey at International Data Corp. in New York.

Analysts said the merger could beef up US West's service by giving it access to more cash and service technicians.

"It's pretty accurate to say US West doesn't get high marks for service. And they claim that's because they have such a geographically dispersed area, where it takes longer to do repairs and installs because technicians have to drive to the back of behind in Idaho," Posey said. "Maybe now, US West can throw more money and people at that problem."

Analyst Jeffrey Kagan in Atlanta said the deal exemplifies how start-ups in telecommunications are merging with established firms to bring new services and technologies to existing markets. ▀

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¹U.S. Dept. of Commerce "The Emerging Digital Economy," 1998. ²Life of fund is as of inception date: 2/4/98. ³Life of fund is as of inception date: 6/29/90. ⁴Average annual total returns include changes in share price, reinvestment of dividends and capital gains, and each fund's 3.00% sales charge and trading fee. Share price and return will vary and you may have a gain or loss when you sell your shares. All Select equity portfolios have a \$7.50 exchange fee and a 0.75% short-term trading fee on shares held 29 days or less. On shares held 30 days or more, the trading fee is the lesser of \$7.50 or 0.75%. Fidelity Distributors Corporation.

75782

Big Deals

Recent telecommunications mergers or joint ventures:

COMPANIES	DATE	VALUE
Global Crossing Ltd./US West Inc.	5/17/99	\$37B
Telecom Italia SpA and Deutsche Telekom AG	4/22/99	\$82B
WorldCom Inc. and MCI Communications Corp.	11/10/98	\$37B
Bell Atlantic Corp. and GTE Corp.	7/28/98	\$52B
AT&T Corp. and British Telecom*	7/26/98	\$10B
AT&T Corp. and Tele-Communications Inc.	6/24/98	\$31.7B
SBC Communications Inc. and Ameritech Corp.	5/11/98	\$62B

*Joint venture

Canion Responds to the Lure of a Start-Up

Compaq co-founder is coming out of semiretirement to help reshape Tricord

Compaq Computer Corp. co-founder Rod Canion re-emerged from semiretirement this month when he was appointed

co-CEO of Tricord Systems Inc. Speaking to *Computerworld* senior writer Dominique Deckmyn, Canion dis-

cussed his reasons for returning to the fray and also briefly commented on the recent turbulence at the company he helped create.

Canion was ousted by Compaq Chairman Ben Rosen in 1991 in a boardroom coup not unlike the one that just unseated his successor, Eckhard Pfeiffer. Canion has since founded a Houston-based consultancy called Insource Technologies Corp.

For Tricord, this is also a comeback of sorts. Founded in 1987, it was successful in the early '90s with a line of Intel-based "super-servers." Now Tricord has decided to refocus on the storage market.



ROD CANION has come out of semiretirement to help lead Tricord Systems

we're really not in a position to talk about the products right now. The general area will be the storage-management arena. It will address the problem of adding storage to a network and managing it as one big pool. One of the strengths of the technology [that we are developing] is that we can apply it directly in some markets with our own products, and at the same time we will license it to [resellers] to sell in other segments.

Q: Do you expect to be at Tricord long-term?

A: No. I enjoyed the free time I had in the situation I was in. When we get through this launch phase and we're up and running as a company, I will step back. But I like working with start-ups and I'm likely to be doing that again in the future.

Q: Your successor at Compaq [Pfeiffer] was removed in a way that closely mirrored your own departure. Do you see an irony there?

A: I really don't see any parallel beyond the fact that Ben Rosen was chairman [both times] and he took a decision that was hard to make and which I think is the right decision. It was critical to do [the sales channel restructuring] now and not wait for a new CEO. My outside impression is that they are making the decisions that need to be made and they are moving on. ▀

Q: You have been really quiet for a couple of years - or has it just seemed that way?

A: Actually, I've been really quiet for six or seven years now, enjoying semiretirement. I've stayed involved [in the IT business], but not in the sense of spending a lot of time. But Tricord was different. It was a high-flier in the early 1990s in the server arena, [headed by John Mitcham], a good friend from Texas Instruments.

Q: What's Tricord up to?

A: Because we are a start-up,

JURIES AHEAD IN TRIALS FOR MICROSOFT

Jurors interviewed in Bristol's private antitrust case against software giant

BY KIM S. NASH

MICROSOFT Corp. and Bristol Technology Inc. last week interviewed potential jurors for a private antitrust trial slated to start June 2. Legal experts said having a jury of ordinary citizens examine Microsoft's business tactics may spell trouble for the big software vendor.

Meanwhile, the judge in the case in U.S. District Court in Bridgeport, Conn., last week denied Microsoft's motion to delay the trial.

Bristol, a small tools vendor in Danbury, Conn., sued Microsoft last August, claiming Microsoft used anticompetitive moves to try to shut Bristol out of the Unix-to-Windows translation tools market. After a contract that gave Bristol access to Windows NT code expired, the two couldn't reach a new deal.

Come June, a jury of six to 10 people will decide whether Bristol's complaints are legitimate.

"Bristol is more likely to be the beneficiary of a jury than Microsoft, especially since one of the themes will be they're just a small local company trying to make a living," said Rich Gray, an antitrust lawyer at Bergeson, Eliopoulos, Grady and Gray LLP in San Jose.

But because Microsoft may

benefit if the trial becomes too technical, Tony Clapes, one of Bristol's lawyers, said he will strive to keep the trial's terms simple. Clapes, a Honolulu-based lawyer at Technology Law Network, worked as a lead attorney for IBM in its federal antitrust case in the 1970s.

The trial, which is expected to last six to eight weeks, could end before the federal antitrust case against Microsoft by the U.S. Department of Justice. That means the Bristol case could be the first to offer a formal decision on whether Microsoft has a monopoly. ▀

Chip Maker Wins Big in Patent Infringement Suit

Judge could triple Crystal award to \$150M

BY STACY COLLETT

A U.S. District Court in Austin, Texas, has awarded audio chip maker Crystal Semiconductor \$48.6 million in a patent infringement suit.

But the award could climb to as much as \$150 million, legal experts said, because the jury also found willful infringement on the part of the three defendants — OPTi Inc. of Milpitas, Calif., TriTech Micro-

electronics Pte Ltd. of San Jose and TriTech Microelectronics International Inc. of Singapore — which will allow the judge to increase the cash award.

"Willfulness findings are significant. It's not unusual to have that [initial award] amount tripled and then to add on attorney's fees," said Robert Koch, an attorney at Fulbright & Jaworski LLP in Washington and a former U.S. Patent Office attorney.

Koch said accusations of willful infringement are part of almost every patent infringement case, but they're difficult to prove.

Austin-based Crystal Semiconductor, a unit of Cirrus Logic Inc., filed suit against OPTi and TriTech in January 1997, charging they copied Crystal's mixed-signal technology for gain scaling, noise management and trilevel capacitors. OPTi left the audio chip business shortly after the suit was filed but remained liable.

The judge could rule on the final damage award as early as this week. According to the attorney's office for the defendants in the case, an appeal was under consideration. ▀

BRIEFS

Dell Profits Up 45%

Dell Computer Corp. reported that strong sales of servers and consumer PCs resulted in first-quarter earnings of \$434 million, jumping 45% from the same period a year ago. Revenue for the quarter was \$5.5 billion, up 41% from the same period last year. Round Rock, Texas-based Dell said it is selling more than \$18 million worth of computers daily via its Web site, or 30% of its revenue.

HP: PC Sales Strong

Hewlett-Packard Co. posted a 34% increase in quarterly earnings to \$918 million, as revenue climbed 3% to \$12.4 billion. Chairman and CEO Lewis Platt said HP enjoyed strong net earnings in PCs, along with growth in its printing and imaging business. Platt is slated to step down after HP splits into separate computer systems and measurement device companies.

Data General Bets \$100M on Storage

Data General Corp. said it plans to spend \$100 million to hire 450 sales, service and engineering staff in the next 18 months in a bid to emphasize its Clariion storage business. Westboro, Mass.-based Data General said its short-term results would suffer but the company expects to find long-term business growth in the storage-area network market that relies on Fibre Channel technology.

Short Takes

COMPUTER ASSOCIATES INTERNATIONAL INC. said it would invest up to \$50 million in financially troubled **CHS ELECTRONICS INC.**, a Miami-based systems distributor to Europe and Latin America. . . . **Chicago-based ERP vendor SYSTEM SOFTWARE ASSOCIATES INC.** said it lost \$7.7 million, down from a \$9.7 million loss for last year's first quarter. The company's revenue dipped by 18%, to \$86.7 million. . . . **Online bookseller AMAZON.COM INC.** in Seattle invested \$42.5 million to buy a 35% stake in **HOMEROCER.COM**, an Internet grocery and home-delivery service in Bellevue, Wash.



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PAUL GILLIN

Power shift

THE RIDICULOUS MARKET valuations that Internet companies command have received plenty of press lately. But what's less discussed is how the Internet has reshaped the financial services industry to create this bubble. It's a situation that holds lessons we all can learn from.

The stock market craziness has a lot of so-called experts in a tizzy because the market isn't acting as it's supposed to. The bubble will invariably burst, they argue, and we'll return to the more rational days of 30X price/earnings ratios.

Maybe not. Because, just maybe, the stock market has changed for good. Through all of history, the equity markets have been run by the elite cadre of traders who made the rules because they were vested with the authority to make them. The arrival of more than 5 million individuals buying and selling online is changing the balance of power.

What's happening is that the stock markets are becoming free markets — and free markets are inherently unpredictable. The conversations that drive markets are increasingly going on outside the clubby confines of the investment houses.

If you want a taste of how the new rules are made, go to the Yahoo Finance stock discussion on the Internet and watch the day traders exhort, scold and trash talk each other



PAUL GILLIN is editor in chief of *Computerworld*. You can contact him at paul.gillin@computerworld.com.

er 24 hours a day. That is no gentleman's club. It's a free-for-all, the bazaar next door to the Wall Street cathedral.

Wall Street is one of the more dramatic examples of what happens when controlled markets become free. Although still heavily regulated, the stock markets are being driven more and more by people who have no concept of how things ought to be done.

Could the same thing happen to your business? To what degree is your business based on knowing things your customers don't? What happens when that advantage goes away?

Those conversations on Yahoo Finance are only the most dramatic examples of exchanges occurring every day among your customers on the Net. You can be part of those discussions, or you can let them take control of your destiny. Wall Street analysts are realizing late that they are no longer the sole influencers of their market.

Maybe those stock valuations aren't so crazy after all. ▀

DON TAPSCOTT

The power of electronic play

HERE'S A STRAIGHTFORWARD message to the electronic entertainment industry: If they play their cards right, game creators could end up driving the entire entertainment, learning and IT industries.

The gaming companies will soon be so sophisticated in key areas such as virtual reality and collaborative computing that expansion into non-gaming software development is the next logical step.

Consider how quickly the industry has grown. This year, video game revenues will top \$8 billion, \$1 billion more than Hollywood box office receipts. Another indicator: This year's Electronic Entertainment Expo (E3) in Los Angeles, which I spoke at, was huge. It attracted about 50,000 attendees, and more than 1,900 new products were showcased.

New state-of-the-art gaming units outpower most desktop PCs. IBM just announced a \$1 billion deal to put a customized 400-MHz version of the PowerPC chip into Nintendo's next player. The new Sony PlayStation 2 will rival a Pentium III-equipped PC. And Sega's new Dreamcast player, the hit of the show, comes equipped with a 56K-bit modem to link to the Net for less than \$200.

Past innovations by the gaming industry in graphic displays, animation, rendering, multimedia and user controls have all made their way into business applications. The games on display at E3 provide a strong indication of applications and features to be found on tomorrow's corporate and education desktops.

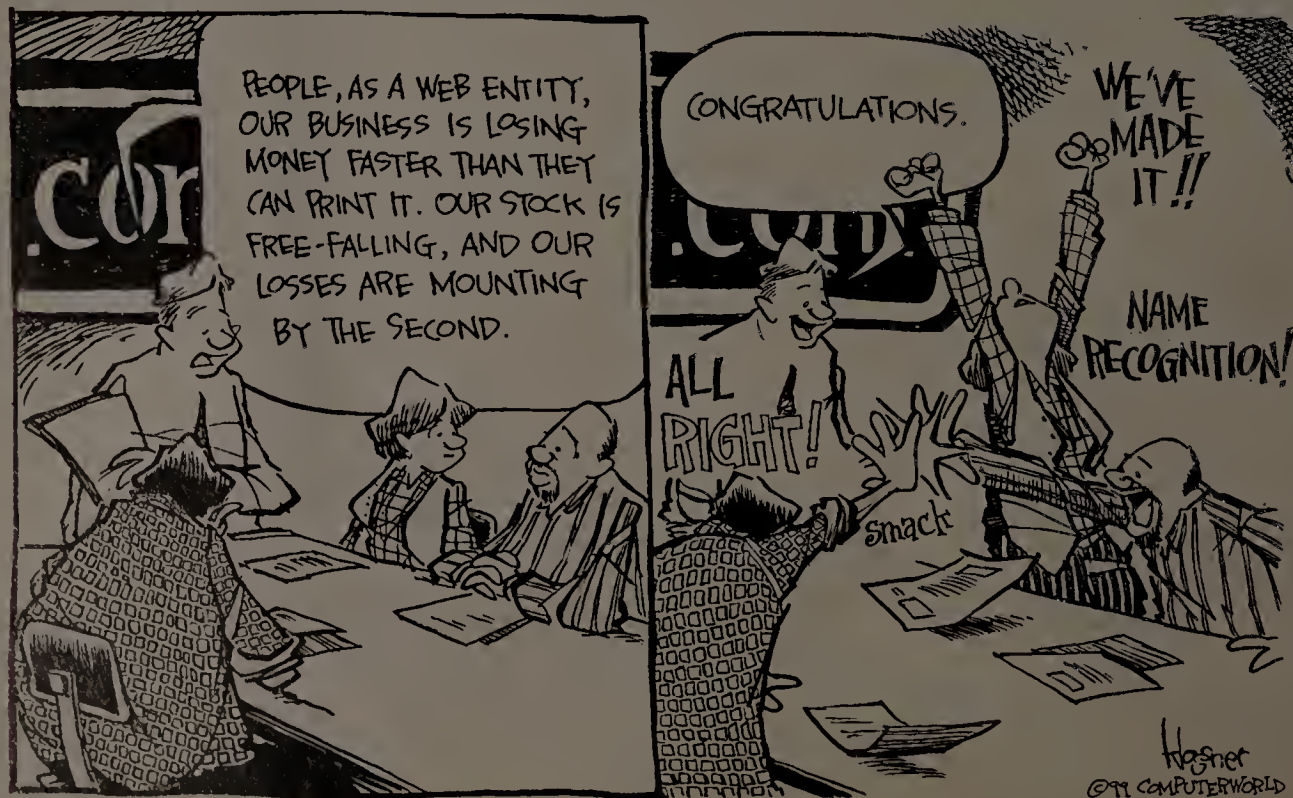
For example, Sony's road-racing simulator *Gran Turismo* lets the user drive any one of 165 realistically depicted cars. The next generation of the game will truly be a multimedia automobile encyclopedia, with highly accurate simulations of the cars' performance, handling, engine sounds and other characteristics.

Such technology will soon be ideally suited to interactive learning. In a few years, marine biology students may acquire much of their education by going for computer-generated interactive swims with dolphins, whales and other sea life.

Corporate human resources departments will love this technology because it will enable low-cost, highly personalized employee training. Programs will be delivered directly to the desktop,



DON TAPSCOTT is chair of the Alliance for Converging Technologies. His latest book, *Creating Value in the Digital Economy* was published this month. Contact him at column@tapscott.com.



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The Faces Behind the eCommerce Revolution



The 1999 Mass eComm 10

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Mass eComm

Dear Reader,

I consider myself a people person, and I think e-commerce is all about people. Prior to founding the Massachusetts Electronic Commerce Association (Mass eComm), I worked on the marketing side of e-commerce, where I met some of the smartest people in New England. These were the people responsible not just for creating a new industry, but for making it explode. They came from different parts of the world and from various professional and personal backgrounds, yet they all possessed the same overwhelming enthusiasm about technology and about what it can do for the world.

It was this enthusiasm that led to the creation of Mass eComm. And it was this enthusiasm that led to the "Mass eComm 10," a selection of people honored annually by Mass eComm for their contributions to the e-commerce revolution. The focus here, as perhaps it should be, is on the people and their achievements. At the 1999 Mass eComm 10 awards ceremony, I hope to spotlight their stories and demonstrate that the drive behind the e-commerce industry is not motivated by profit or technology per se. The drive is sustained by people, many of whom make their homes right here in New England.

On May 24, 1999, New England's technology leaders will come together at the Westin Copley Plaza Boston to celebrate these individuals and their stories. By honoring and learning from the Mass eComm 10, we hope to inspire the young entrepreneurs who will continue the industry's spectacular growth. This supplement is a tribute to those individuals as well. I hope that reading this supplement will give all of us a fuller appreciation of how invigorating the e-commerce community can truly be.

Thomas Hopcroft
President
Mass eComm

From dorm rooms to board rooms. . . eCommerce is about People

Highlights from
the 1999 Mass
eComm 10

Photo by A

Matt Cutler stands in front of the MIT fraternity house where he founded net.Genesis. Today he is chief e-business intelligence officer of the company.

By Tyler Ross

Matt Cutler began shaping e-commerce in 1994 from an MIT fraternity dorm room. With the World Wide Web still brand new, he concluded that the growth of online business would largely depend on the creation of a set of tools for tracking customer attitudes.

At the time, MIT frowned upon student entrepreneurs. School officials believed that students should spend their time studying. But Cutler was undeterred. In meetings held in "clandestine" locations—computer labs, lunch rooms, on street corners—Cutler honed his business model, and took a major gamble by founding a company called

net.Genesis. Even though the first company office was a dorm room, Cutler transformed the nascent net.Genesis into an e-commerce mainstay. Through that transformation, his vision remained intact: The way to sell online is to know your customer.

Cutler's story is refreshing, since the term e-commerce often conjures images of routers, servers and wires, rather than images of people like Matt Cutler—who had the foresight to recognize the potential of ideas and then worked tirelessly to turn their vision into reality. Without these faces, the e-commerce business would not exist today.

Such faces belong to the "Mass eComm

10," the ten people from the New England e-commerce community who are honored annually by the Massachusetts Electronic Commerce Association (Mass eComm). The Mass eComm 10 spotlights the individuals leading the e-commerce revolution, and their stories, in the hope that they might inspire others to follow in their footsteps.

Built on blind faith

One such individual is Henry Bertolon, founder and president of NECX, the company he says he "built on blind faith." That faith helped land Bertolon a place on the Mass eComm 10 for the second straight year. "I am long on faith, passion, vision, stubbornness and execution," he adds. "I am very proud that my company is homegrown."

Bertolon's homegrown company is now the largest online retailer of computer products in the world. Through NECX.com, visitors can buy anything from spare computer parts to handheld Palm Pilot device. Bertolon has been at the helm of NECX since the beginning and has watched the company change its course as the Web came into existence. In that time he has personally affected the growth of online commerce.

Bertolon has been willing to take the risks associated with that position. Risk for him often meant changing his company's selling practices in dramatic ways. For example, with the introduction of the Web, he completely shifted his business model, which at that point consisted of distribution of client software on diskettes, to the online world. More recently, in 1998 he made NECX the first and only online retailer to truly offer competitive pricing. Visitors to the NECX Web site can compare NECX prices with those of other online retailers.

Another member of the 1999 Mass eComm 10 is Ralph Folz, who made his own "Web shift" back in 1994 when he refocused

his company to create Web sites specifically designed with enhanced content for selling services. As when Bertolon transformed NECX, the Web at that time was brand new, and Yahoo! was just a list of bookmarks on the home page of a university student named Yang.

"It was a huge risk," Folz recalls, "but we were a company of only two or three people. When you're that small, taking a big risk doesn't seem like such a big deal." Today, Folz is president of TVisions, an independent Web consulting, design and development firm he co-founded.

Risk-taking is a common theme among the 1999 Mass eComm 10. Folz took his gamble when he launched a new Web design for Fidelity Investments, complete with an interactive calculator for investors. This calculator was one of the earliest truly interactive items on the Web, and as its usage rocketed, Folz and his colleagues reveled in the growing number of users. "Seeing how many people visited that calculator was the most exciting thing for us," he says.

Rolling the dice

Rob Davis, CEO of Lycos, rolled the dice earlier this year when he predicted that a new network strategy would propel Lycos past Yahoo!. The world called him quixotic. But the Internet portal shocked the industry in April by becoming the most visited site of its kind. The news was not surprising because it was Lycos, but rather because Lycos displaced Yahoo! from the top spot on the list.

Risks are nothing new for Davis though, who is often described as the warrior from the gritty streets of Dorchester, Mass., who

1999 Winners

- * Henry Bertolon
- * Matt Cutler
- * Robert J. Davis
- * Gary Eichhorn
- * Ralph J. Folz
- * Blaise Heltai
- * Anna Sabasteanski
- * Jeet Singh
- * David S. Wetherell
- * James C. Wood

put himself through Northeastern University and became the first employee at Lycos—back when the Lycos workspace was merely a single cubicle.

While toppling Yahoo! is what places Davis squarely in the 1999 Mass eComm 10, it is just one of his recent achievements. Earlier this year, Davis announced what could become the biggest e-commerce deal of 1999: a proposed merger between Lycos and the interactive properties of USA Networks. The new combined company, USA/Lycos, would boast a massive e-commerce infrastructure, both on and offline, as well as the ability to sell products on television via Home Shopping Network (a USA property).

The pace of e-commerce is so fast many companies fear being left behind. For Anna Sabasteanski, helping Fortune 1000 companies overcome this fear is a task not just for one person but for an entire company. As

she sees it, it's a challenge to convince businesses to be practical about the Internet.

Now chairman of the board and vice president of practice management at Empresa, Sabasteanski is not awed by the new technologies but rather has a deep understanding of how e-commerce can transform a company. Her continuum of e-commerce successes has landed her on the Mass eComm 10 for a second straight year.

"E-commerce to me is looking at the entire enterprise of a company and seeing where the Internet fits in," says Sabasteanski. "Many times we are described as the people with the gray hair. We know what all the technology means to business."

Unlike many recent Internet entrepreneurs, Sabasteanski can recall the days before the Internet, when e-commerce existed even though the World Wide Web did not. In those days, computers were the domain of "nerds"

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and the public distrusted all things technical. Yet despite this pervasive distrust, persistent entrepreneurs took the leaps necessary to make today's e-commerce boom a reality.

True beginning of e-commerce

To many observers, Open Market represents the true beginning of e-commerce. The company's products allow other firms to sell online without having to build e-commerce transaction solutions from the ground up. Gary Eichhorn, president and CEO of Open Market, is greatly admired because he led his company through several strategies while continuing to create value for its shareholders and customers. For this reason, Eichhorn earned his place on the Mass eComm 10 in 1999.

Like Open Market co-founder Shikhar Ghosh, a member of the 1998 Mass eComm 10, Jeet Singh emigrated from India for the educational and technical opportunities offered in Boston, selecting MIT over such prestigious Ivy League schools as Princeton University and Columbia University.

After graduating, Singh co-founded Art Technology Group, a firm specializing in online e-commerce and personalization solutions. Today he is not only president and CEO of the company, but he is also a shining example of the growing number of immigrant entrepreneurs who are helping fuel the e-commerce explosion in Massachusetts. For his continuing successes in this area, Singh has earned a position on the Mass eComm 10 for a second straight year.

Jay Wood, president of Silknet Software in New Hampshire, is the only member of the 1999 Mass eComm 10 not based in Massachusetts, but his impact on New England's e-commerce community is no less profound. His firm provides the online customer software that is essential to e-commerce. On the Web, where the next store is only a mouse-click away, customer service can determine whether a cus-

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tomer will do business with a company or look elsewhere.

Wood's latest concept, Silknet eCommerce, integrates customer service capabilities with e-commerce transactions. The promise of reducing expensive call centers through the use of online communications represents a major e-commerce opportunity for his company. Customer service popped up on many e-commerce radar screens in 1999 and with that trend, Jay Wood earned a spot on the Mass eComm 10.

Wood's company has extended e-commerce into the arena of customer support. For another much anticipated e-commerce vertical—banking—the torch-bearer in New England is Blaise Heltai, managing director for corporate Internet strategy at Fleet Financial Group.

Since he joined Fleet in 1996, Heltai has compiled an impressive list of firsts: Fleet became the first major bank in New England with Internet banking and the first major

bank in the United States to introduce an electronic storefront product for small businesses. Heltai also led Fleet into several deals never possible before the Internet, and never before tried. These include deals with *US News & World Report*, Family Education Network and boston.com. As an e-commerce leader in the financial community, Heltai earned a position on the 1999 Mass eComm 10.

Venture funding

The gamble of so many e-commerce entrepreneurs, past and present, could not have been realized without venture funding. A name that is almost synonymous with high-tech venture funding is David Wetherell, chairman of CMGi.

Wetherell's venture company is called @Ventures, and it has invested in, or owns outright, at least two dozen Internet companies and has returned a staggering \$1.9 billion on \$39 million in venture investments, according to TheStreet.com. Not surprisingly,

CMG stock is up 122% since the beginning of the year (as of press time).

Wetherell, a mathematician turned financier, celebrates his second straight year on the Mass eComm 10. His influence in the New England e-commerce community ranges from the traffic of portal sites (Lycos), to Web site hosting (NaviSite), to online communities (GeoCities and PlanetAll). His wizardry has certainly impressed Wall Street and, to a great extent, has charged the Internet economy as a whole.

No one strikes out

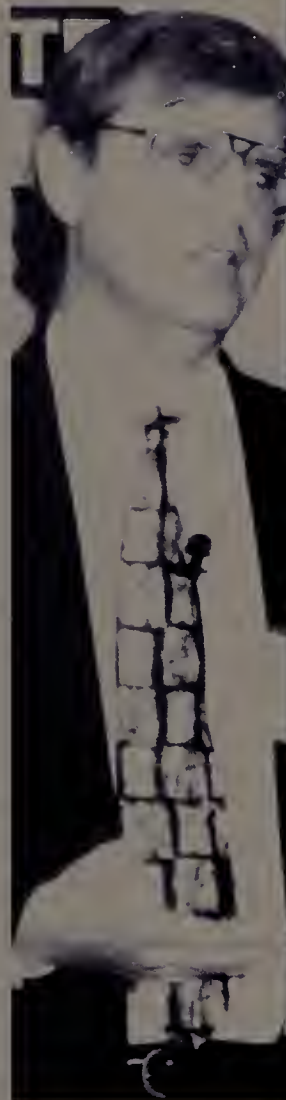
Each and every member of the Mass eComm 10 has taken the risks necessary to rapidly grow the e-commerce industry. It's understandable that within this World Wide Web of technology, the human element is often overlooked. But the image of young Matt Cutler sipping coffee outside his frater-

nity house, while maxing out his last credit card to meet payroll, is perhaps more significant than any technology that might come down the road.

Cutler remembers one particularly poignant moment when faith was necessary to beat overwhelming odds. When net.Genesis was still in its very early stages, MIT became suspicious of Cutler's activities and decided to chastise him for his possible commercial use of MIT property.

"One of the MIT network managers brought me into his office and gave me a kind of slap on the wrist," Cutler remembers. "They told me it was my first strike. And they said I had two strikes left."

Fortunately, Cutler did not strike out back then at MIT. And now, five years later, in 1999, he, along with nine other e-commerce entrepreneurs, is a member of the Mass eComm 10.



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E-business is, first and foremost, about business. The most successful e-businesses to date are led by a strong management team, employ strategic thinking around the opportunities and challenges of e-business, and are prepared to re-engineer processes dramatically, not just incrementally to successfully implement an e-business strategy.

Moreover, e-business has issues of its own: trust, security, digital money and other electronic payment systems, and Internet-specific regulatory and tax issues. It's a lot to consider, but e-business pioneers need not go it alone. Deloitte Touche Tohmatsu provides accounting and auditing, tax, and management consulting services through more than 82,000 people in over 130 countries. We've assisted some of the leading companies operating on the Net, and we're here to help you. After all, who connects you with the e-business trends that matter? The answer is Deloitte & Touche.



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NECX has been at the forefront of technology innovation for over 18 years and today manages the most comprehensive electronic commerce site for computer products on the World Wide Web. Corporate-wide revenues for 1997 exceeded \$406 million. A privately held company founded in 1980, NECX conducts business from its worldwide corporate headquarters in Peabody, Mass. The company has access to more than \$3 billion in computer products in more than 23 supplier warehouses at any one time. NECX is always looking for good people to join its professional ranks. Additional information is available at www.necx.com.



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The agency is on INSIDE PR's 1998 "Best of the Best" list of high-technology PR agencies. Additional information is available at the company's Web site at www.schwartz-pr.com.

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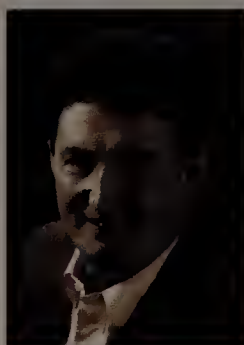
Henry Bertolon, President & CEO, NECX

As founder of NECX, Henry Bertolon has been at the forefront of technological innovation for nearly two decades. Under his leadership, NECX has become the world's central exchange for the buying and selling of ICs and computer products on the open market. After establishing and legitimizing the independent distribution of high-tech commodities, Bertolon seized a leadership position for NECX on the Internet with the creation of the industry's largest and most complete electronic commerce Web site for computer products. His energy, vision, and understanding of the marketplace continue to fuel the company's spectacular growth.



Matt Cutler, Co-founder & Chief E-Business Intelligence Officer, net.Genesis

Matthew Cutler co-founded net.Genesis in January of 1994 as an MIT undergraduate. In 1995, Cutler literally wrote the book on Web site analysis: *Build a Web Site: A Programmer's Guide to Creating, Building, and Maintaining a Web Presence*. Matt frequently presents at major national and international Internet-related conferences including InternetWorld, Gartner Group B-Commerce conferences and Internet Commerce Expo (ICE), and has contributed to *CIO Web Business Magazine* and *Internet World Magazine*. He has also served as President and Chairman of the Webmasters' Guild [now a part of the Association of Internet Professionals], the country's first professional association of Webmasters.



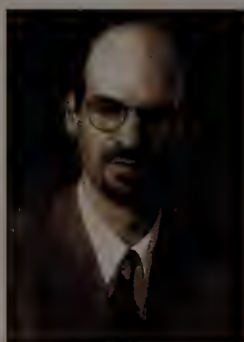
Robert J. Davis, President & CEO, Lycos, Inc.

The company's first employee in June 1995, Robert J. Davis has helped Lycos evolve from an Internet search engine to one of the most powerful Internet hubs and Web media companies. Through a string of strategic partnerships and acquisitions, he has led Lycos in developing the Lycos Network, a pioneering Web media model that delivers mass reach and diversity of audience and programming. This community-based, integrated network includes three top 10 Web sites and is the most visited hub on the Internet. Prior to Lycos, he spent 14 years in high-tech sales and marketing management positions. He currently serves on the board of directors of the Massachusetts Software Council.



Gary Eichhorn, President & CEO, Open Market

As president and CEO of Open Market, a provider of Internet commerce and information publishing software, Gary Eichhorn is responsible for the entire operations of the company, including strategic corporate direction and growth. He joined the company in 1995, led it to its IPO in May 1996, and transformed it from a service-based organization to a leader in software applications. He previously held executive roles at Hewlett-Packard and Digital Equipment Corp. He is active in driving many issues in the industry, and was a key member of the initiative that aligned the largest suppliers of UNIX systems around a single set of specifications to ensure the operating system's long-term competitiveness.



Ralph J. Folz, Co-founder & President, TVisions

Ralph Folz founded TVisions in 1994 and has grown the company from a two-person shop to a leading independent Web development firm that currently employs more than 110 full-time employees. He has been instrumental in the creation of some of the first commercial Web sites. He is the driver behind TVisions' philosophy of leveraging Internet technologies to enhance business process efficiencies. Previously, he was a principal engineer, manager and developer at GTE and has also advised several of New England's largest computer companies on how to integrate the convergence of multimedia technologies into their offerings. In 1998, he was a finalist for the Ernst and Young "Entrepreneur of the Year" award.



Blaise Heltai, Managing Director for Corporate Internet Strategy, Fleet Financial Group

Blaise Heltai is responsible for the corporate-wide development of Internet-enabled business strategies for R&D and for the coordination of all Fleet online initiatives. He previously was director of Fleet's Online Financial Services Group where he managed the consumer and small business online channel. Prior to joining Fleet in 1996, he was director of marketing and strategy for AT&T's Consumer Products Division. His background includes the assessment, development and market introduction of high-technology consumer products and services.



Anna Sabasteanski, Chairman of the Board & VP of Practice Management, Empresa

With vast knowledge and experience in content management and subscription services, Anna Sabasteanski is responsible for managing Empresa's publishing customer relationships as well as the overall P & L for the business unit responsible for the delivery of these solutions. She was the founder of Electronic Press Services Group. With over 20 years experience in delivering online systems, she is positioned as both a technical and business expert for Internet commerce, and in 1998 was named one of the top 10 e-commerce leaders by the Massachusetts Electronic Commerce Association as well as one of the top 40 software leaders in *The Improper Bostonian*.



Jeet Singh, President & CEO, Art Technology Group, Inc.

As CEO and president, Jeet Singh is responsible for the business strategy of Art Technology Group. Together with co-founder Joseph Chung, he has led the strategic design and development at ATG, bringing the company to the forefront of Relationship Commerce. Prior to founding ATG, he held positions in project management, product marketing and management, and new business planning and development, including product marketing manager at Boston Technology, Inc.; a management consultant with Team Technologies, a Washington, DC-based consulting firm specializing in workgroup productivity; and with Groupe Bull/Bull Corp. of America.



David S. Wetherell, Chairman & CEO, CMGi, Managing Partner, @Ventures

David Wetherell has served as chairman, CEO and president of CMGi since 1986. He took the company public in January, 1994; a month later, he founded the Internet start-up company BookLink Technologies. In late 1994, BookLink was sold to America Online in a stock-based transaction that ultimately was worth over \$70M to CMGi. He used the sale's proceeds to fund a two-pronged strategy: the incubation of a series of start-up Internet firms, and the formation of @Ventures, an affiliate that invests in early-stage Internet and interactive media technology companies. Prior to CMGi he co-founded the software development firm Softrend, Inc.



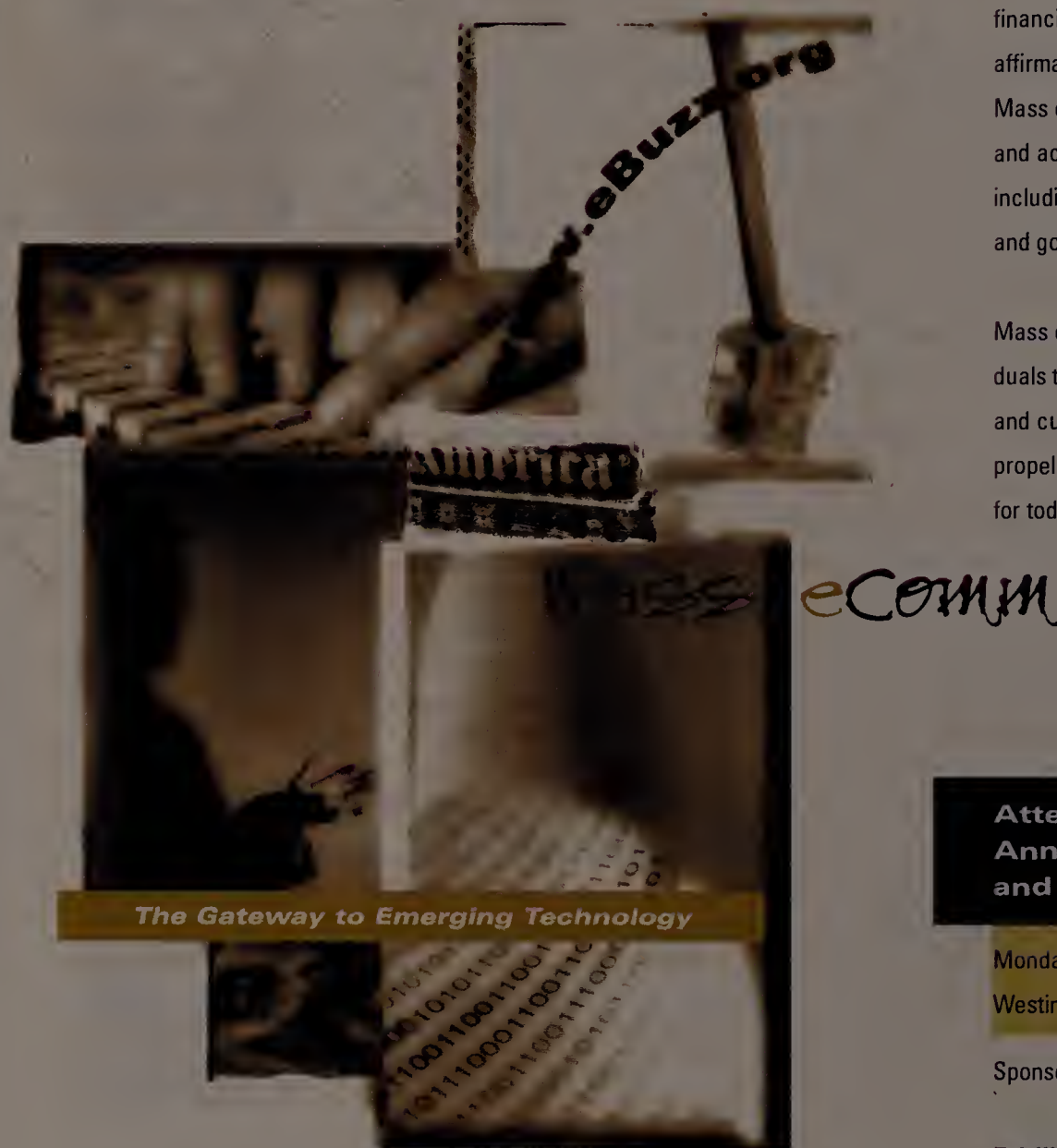
James (Jay) C. Wood, Founder, President & CEO, Silknet Software

Jay Wood founded Silknet Software to develop enterprise applications that leverage the Internet and other emerging technologies in order to improve customer efficiency and loyalty. The e-business solutions offered by the company enable corporations to integrate, engage and leverage the customer. Wood sees his role at Silknet as that of a facilitator, providing the executive staff with everything they need to execute: direction, goals, tools, resources and assistance. He also founded CODA Inc., the North American subsidiary of the U.K. developer of financial accounting software. He graduated from Villanova University with a B.S. in Electrical Engineering.

The Power of the Individual Within e-Commerce

E-commerce represents a synergy among business professionals. The e-commerce revolution originated as a concept in the minds of people with a vision toward the future. Those people looked to other people with the same foresight — for financing, technological support or just affirmation. At the forefront of this activity, Mass eComm was founded to foster ideas and actions across diverse industries including academia, technology, marketing and government.

Mass eComm provides a forum for individuals to share experiences, find resources and cultivate ideas that will continue to propel the industry's phenomenal growth for today and into the future!



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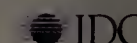
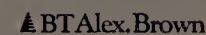
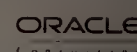
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and employees can learn at their own pace.

The hottest product group at E3 was Internet-based multiplayer games. Players find them the most challenging and rewarding. Some games can involve thousands of players simultaneously, forcing the users to divide into teams and share information to survive. As those games improve, gaming companies will develop new techniques to help teams develop strategies, reach consensus and coordinate their activity. The most successful techniques will be quickly adapted to collaborative software for business use.

Nintendo or Sony as the next Microsoft? Why not? Each has leading-edge technology and hundreds of millions of fans willing to devote countless hours to honing every innovation. It could be an unbeatable combination. ▀

DAVID MOSCHELLA

Behind Gates' big bet on bandwidth

IF YOU RAN MICROSOFT and were sitting on \$20 billion in cash, what would you do with it? Even if you tried, you couldn't possibly spend that much on developing new software, and with the Justice Department looking over your shoulder, you probably couldn't acquire other software or Internet industry leaders. If you decided to diversify into the computer hardware or services markets, you would infuriate many of your biggest and best business partners.

Yet if, like Bill Gates, you're a true believer in the power of IT, you simply couldn't bear to squander huge chunks of IT industry money on media properties, professional sports teams, real estate holdings or boring old dividends. Indeed, from this perspective, Microsoft's decision to invest aggressively in telecommunications should be seen as almost inevitable. What other areas could possibly soak up this amount of cash? What's

really interesting isn't what Microsoft has done, but the way it is doing it.

When you look down the list of Microsoft initiatives — \$1 billion in Comcast, \$5 billion in AT&T, \$600 million in Nextel, \$500 million in the British cable firm NTL, along with smaller investments in Qwest, Qualcomm and Northpoint — there's a clear pattern. Cable and wireless technologies are in; twisted-pair copper is out. Given

that so much of today's Internet is based on local telephone wiring, it's clear that Microsoft is betting on a radically different future, one where its vast wealth is truly needed and where future monopolies are once again possible.

If all of this conjures up a sense of déjà vu, remember that back in the early 1980s, a cash-rich IBM went on its own telecom buying binge. It developed both Satellite Business Systems and the IBM Information Network; it acquired PBX maker Rolm and took a significant stake in MCI. Like Microsoft, IBM had grand visions of the coming convergence between computers and communications. But IBM badly misread the market. It thought that its main network rival would be AT&T and wound up ill-prepared for LAN-based technologies from Novell, Cisco and others. Ultimately, IBM's great wealth was mostly spent in vain.

Microsoft seems to see things more clearly. Depending on the sector, Microsoft faces many tough competitors, such as Oracle, Lotus, Sun and others. But the two currently most worried are AOL and Yahoo. Both companies have benefited enormously from the telephone-based Internet

infrastructure, both are vulnerable to new generations of cable and wireless services, and both have no real cash to speak of. Certainly, neither company can enter the wireless or broadband cable markets without carrier cooperation.

Thus, Microsoft hopes to use its enormous wealth to outflank its rivals, but in a politically palatable way. Consumers should actually benefit. Certainly, there are few IT areas in more need of large investments than local loop bandwidth and wireless data infrastructure. Why shouldn't Microsoft's money be used? From a broader industry perspective, a steady transfer of profits generated by monopoly PC operating systems into badly needed bandwidth capacity has a certain systemic efficiency, even beauty.

If nothing else, Microsoft's investments might light a fire under the cash-rich, but seemingly still ossified, regional Bell operating companies to finally get serious about high-speed digital subscriber line services. With companies like AOL and Yahoo on the telcos' side, Microsoft, AT&T, Nextel and others would have a very fair fight on their hands. Given where we are, can you think of a better way forward? ▀

READERS' LETTERS

Captain should go down with Microsoft

TAKE ISSUE WITH Bill Laberis' pro-Microsoft column ["The Press Shouldn't Put Gates on Trial," CW, March 15]. First, given that Bill Gates is the Microsoft CEO, he essentially is on trial since he bears full responsibility for all of Microsoft's business practices.

Second, Mr. Laberis' assertion that Microsoft is the most successful public company on earth is borderline ludicrous. Most of the success credited to Microsoft was derived via unlawful and unfair means over a relatively short period of time.

What about giants like P&G, GE and IBM that have proved successful using fair and legal tactics for years long before Microsoft existed?

Third, the numbers concerning Microsoft's dominance of the application platform/server market in two years based on a study of 200

IT managers demonstrate two things: We're in big trouble if we've got IT managers today who've already decided their platform of choice two years in advance; and these IT managers must be out of touch with the technology trends that are evident today.

Finally, you seem completely lost in your "technology purchase process" paradigm. The end user cares nothing of the purchase process but rather the functionality, effectiveness, reliability and quality of the technology itself.

As an engineer, I'm continually amused and troubled by your publication's IT manager-centric view of the world.
Jeremy Steele
j.j.steele@cummins.com

Y2K fact checking

AMIDST speculations about the impact of Y2K, we find that statements that have been portrayed as "facts" don't stand up

to scrutiny. For instance, in an April 5 *Computerworld* article on Y2K and pharmaceutical companies ["Foreign Supply Failure Worries Drug Makers"], your reporter repeated inaccurate assertions found in a U.S. Senate report about the world's insulin supply.

We have seen several variations of the statement that 70% of the world's insulin is made in Denmark (or the Netherlands).

Another statement — which also was included in the Senate report — says 80% of raw materials used in manufacturing pharmaceuticals is sourced from outside the U.S.

These inaccurate statements could unduly cause worry about having enough insulin at the start of the new century. That is unfounded.

Lilly manufactures all of its human insulin in the U.S., near its company headquarters in Indianapolis. Only 15% of the raw materials Lilly uses to make its insulin comes from countries

other than the U.S. In total, we rely on 44 suppliers for those raw materials to make insulin, and only nine of them are located in countries outside the U.S. Furthermore, in the U.S., we have all of the raw materials we need to make our 1999 year-end target inventories for major Lilly products.

Lilly is working to explain our Y2K readiness and address the flow of insulin to consumers.

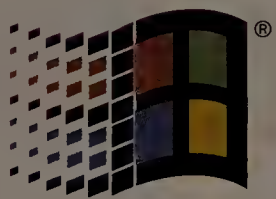
Given the importance of the Y2K issue, it is crucial that statements given as "fact" are indeed true.

Doyia Chadwick
Eli Lilly and Co.
Indianapolis

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DAVID MOSCHELLA is an author, independent consultant and weekly columnist for Computerworld. Contact him at dmoschella@earthlink.net.



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ANN HARRISON

Uncle Sam's secret cryptography plan

U.S. OFFICIALS are sure to appeal the recent ruling which extends First Amendment protection to strong cryptographic source code. The decision by the Ninth Circuit Court of Appeals in the case of University of Illinois professor Daniel Bernstein is a giant step toward lifting encryption export restrictions. The ruling allows strong encryption to be used by companies doing business overseas.

The feds will complain that the release of strong U.S.-made cryptography will hamper law enforcement. But what the government really fears is losing the ability to spy on citizens and private businesses.



ANN HARRISON is a senior editor at *Computerworld*. She covers security and privacy issues. Contact her at ann_harrison@computerworld.com.

Some criminals and terrorists do use strong encryption to scramble their Internet communications. But those encryption tools are already available from sources overseas. If the Supreme Court overturns the Bernstein ruling, it's not crooks who will be in the most danger — but

honest businesses everywhere. It's hard for many Americans to imagine their government conducting industrial espionage, but it's happening.

It's worth remembering that the U.S. government insisted the 56-bit Data Encryption Standard was secure long after security experts surmised that spooks at the National Security Administration (NSA) could crack the code.

Now, the European Parliament is blowing the whistle on U.S. spymasters. This month, the parliament's Science and Technology Options Assessment Panel reviewed a report on Echelon, the U.S.-led satellite surveillance network (www.iptvreports.mcmail.com/stoa_cover.htm).

Although the U.S. government has never confirmed Echelon's existence, dozens of investigative journalists have written about the system. It allegedly intercepts telephone, data, cellular, fax and e-mail transmissions anywhere in the world. The report includes evidence of how U.S. intelligence agencies intercept Internet traffic and digital communications — including screen shots of traffic analysis from NSA computers. The report found that Echelon targets not just criminals, but also diplomats and industrialists.

Not only Europeans are worried about Echelon. U.S. Rep. Bob Barr (R-Ga.), who once worked for the CIA, says the project raises questions about constitutional rights. He worries that the NSA

will use Echelon to circumvent laws that prohibit the government from spying on citizens.

Echelon isn't the only project that puts private companies at risk. The same European Parliament report documented an international organization of police and security agencies called ILETs (International Law Enforcement Telecommunications Seminar).

ILETS has succeeded in convincing European Union policy-makers to require "interception interfaces" in all future Internet and digital communications systems. The plan, which appears in a EU report called "Enfopol 19," envisions a network of tapping centers that lets European intelligence operatives eavesdrop on telephone calls or Internet traffic. That strategy would put the unsecured communications of U.S. companies doing business in Europe at great risk. It would also force Internet providers and network operators to foot the cost of setting up surveillance systems.

The FBI estimates that U.S. companies lose \$2 billion per month to industrial espionage. The power to wiretap and subvert strong encryption only increases the vulnerability of businesses and citizens, which intelligence agencies claim to defend. If businesses use weak encryption in international transactions, and Uncle Sam collects their data, it could wind up in the hands of anyone, even competitors and foreign governments.

Contact your local member of Congress and let him know that global surveillance systems require legal accountability and oversight. And be sure to secure your most sensitive international business data with strong encryption made by companies that aren't hampered by export restrictions. Remember, the NSA is listening. ▀

JOHN GANTZ

Is your IT shop ready to compete?

IS YOUR IT organization worth its salt? Can it beat the competition? Two minor events last week got me thinking this was a question that more and more CEOs will be asking soon.

The first was this: my 14-year-old son went to Washington on a weeklong field trip with his school. Each night, the class had pictures and write-ups on the class Web site. This took place during the same week my company had a major meeting about our IT infrastructure — and learned how long it will take and how difficult it will be to allow each product



JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idcresearch.com.

group to have its own intranet. My immediate reaction was to ask the eighth-graders to take on the project.

The second was a conversation I had with a colleague. He told me the supply-chain consulting practice of Ernst & Young was getting about a third of its billings in value-based payments. Those are payments triggered by business metrics, like lower actual costs, increased revenue and time-to-market milestones. My colleague pointed out that companies like Ernst & Young have begun hiring industry experts and financial types — as opposed to IT technical specialists — in order to take on this kind of work.

Now, I have to admit we're looking at two leading-edge IT organizations here — Ernst & Young and the eighth-graders at Wayland Middle School. But I think there's a message here for the average IT shop.

If a leading-edge IT practice inside a leading-edge outsourcer is willing to put some skin in the game on major IT projects, then other outsourcers will soon follow. Shouldn't your own IT organization also put some skin in the game, for example, by tying bonuses or stock options to the financial outcome of the project? Yet a lot of IT shops still think in terms of projects and see themselves competing with companies like Ernst & Young on a time-and-materials basis. If we're not careful, innovative external companies will cherry-pick the most strategic (and hence valuable) IT projects on a risk-and-reward sharing basis and leave us to the Windows upgrades, Y2K clean-up and e-mail conversions.

And if the average end user's expectations of IT can be set by the prowess of a bunch of eighth-graders, whether unfairly or not, then the average IT organization has already lost the public relations battle against potential competitors.

We have had competition between outsourcers and internal IT organizations for years. But the nature of the competition is changing.

Internal organizations used to be able to compete at least on price, having budgets that didn't reflect fully allocated costs and not having a requirement to make a profit. When they lost it, it was often for lack of rare technical skills, lack of time and energy to devote to certain projects or because of a need for cash (many outsourcers will swap cash for clients' assets, which they then lease back). With value-based pricing, that advantage goes away.

I think the leading-edge professional service firms are going to pull away from the average — and someday even the exceptional — internal IT organizations. Their corporate lives depend on it. And the reality we're all getting used to with the Web — that with outside help, applications can be developed in days, weeks or even overnight — may make outsourcing the preferred approach. IT organizations will have to prove themselves over and over again on a daily basis — just like their for-profit competitors. In time they may even have to resemble IT service firms, with a sales force, partner organization and profit sharing. Pretty radical. And quite possible. ▀

BUSINESS

SELL TO SENIORS

Think your Web customers are all young and hip? Nope. At least half are over 50. They've got tons of spending power, but they won't struggle with sites they don't like. Many sites cater to them — to good effect. **► 58**

ON THE RIGHT TRACK

Better contract management means companies can better track their negotiated pricing — for pharmaceuticals, for instance. **► 45**

BIG BROTHER'S WATCHING

At W. W. Grainger, employees wear cards that let them track one another. They're a way to keep customers happy by getting reps online with them fast, but where's the line between good service and privacy? **► 40**

GLOBAL DEVELOPMENT

Development is development, right? Wrong. Spread it across several countries to save time and money, and cultural misunderstandings can gum up the works. This Q&A with an expert on international development might help. **► 46**

GLOBAL SCHMOBAL

Sure, developing applications globally might (eventually) work, but a

global economy? The problems of international trade are so daunting, it's surprising anyone makes any money, Jim Champy bemoans. He calls worldwide e-commerce a myth. **► 47**

GENERALISTS WANTED

The age of the IT specialist is over, at least in e-commerce, Lina Fafard writes. People with one main skill are overwhelmed when faced with the mass of issues related to complex sites. She lays out hot skill combinations. **► 57**

LOCATION, LOCATION...

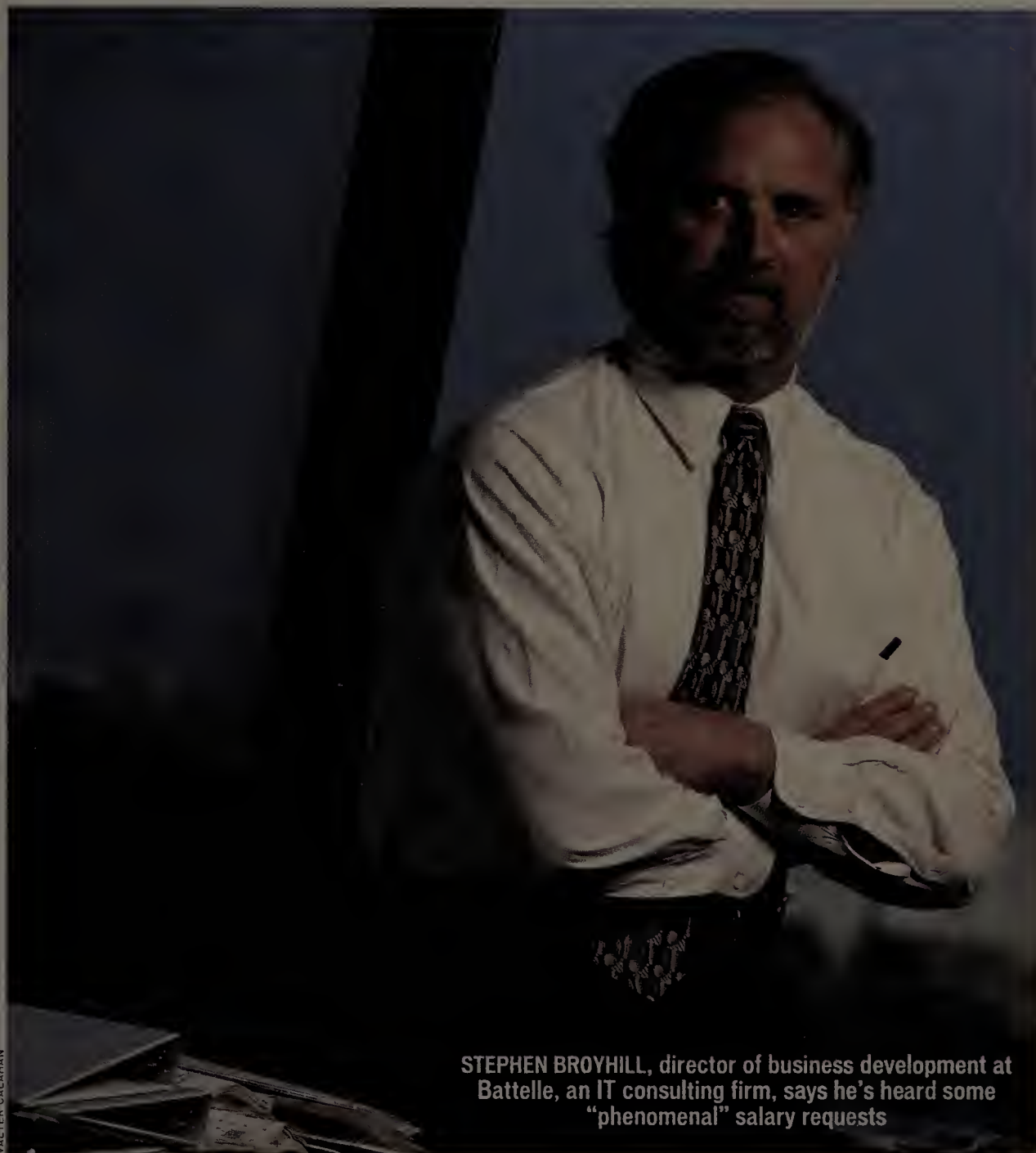
Where do big retail operations go when they want to sell stuff online? San Francisco, mostly. Many find they have to move Web units away from the center of their brick-and-mortar operations to encourage innovation. **► 41**

HOW TO PREVENT INSIDE JOBS

The worst hack in U.S. history was engineered by someone inside the firewall. A new survey shows internal attacks outpace those from the outside. It takes careful monitoring and attention to detail, not just a firewall, to catch insiders. **► 40**

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STEPHEN BROYHILL, director of business development at Battelle, an IT consulting firm, says he's heard some "phenomenal" salary requests

CAN I HAVE SOME MORE?

Computerworld's 2nd Annual Consultants Salary Survey shows consultants with hot skills are drawing bigger paychecks, getting bonuses and benefits, having their relocation costs covered and reaping some other cheeky perks and requests. Why? Because the ones with the right combination of IT and people skills are impossible to find.

50



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What do you need most?

INFRARED SYSTEM KEEPS ITS EYE ON EMPLOYEES

Team spirit thwarts Big Brother overtones in quest to improve customer service

BY STACY COLLETT
GURNEE, ILL.

THE LATEST weapon in customer service hangs around Tom Condon's neck.

As he traverses the sprawling maze of workstations at W. W. Grainger Corp.'s Custom Solutions Center, his identification badge emits infrared signals. The signals are picked up by receivers on the ceiling that report his whereabouts to the company's personnel directory on the intranet.

If a customer needs Condon in a hurry, the receptionist merely clicks on his name in the company's personnel directory, finds his location — which is updated every five seconds — and sends him a

targeted audio message from an overhead speaker.

Sound like Big Brother watching? No, Grainger said, it's Big Customer.

In the maintenance equipment industry, where the price and quality of competing products are very close, customer service is becoming the differentiator for companies like Grainger. So executives are eliminating phone tag, pagers and public address "carpet bombing" in favor of employee-tracking via the intranet.

"It's a tool to reduce time in solving problems and improving customer satisfaction," said Condon, director of information services at Grainger.

Some 200 employees are connected to a browser-based suite of tools called ArialView



TOM CONDON of W. W. Grainger wears a badge that emits an infrared signal that tracks his whereabouts in the office

from Arial Systems Corp. in Vernon Hills, Ill. Condon said Grainger's \$100,000 investment will pay off because it helps the company respond to customer calls about five minutes faster. With the number of ArialView "searches" rising to

900 per day and expected to climb to 1,500 daily by this summer, Grainger will realize a half-million dollars a year in productivity savings, he said.

Other companies offer personnel directory software, but Arial is breaking ground by

adding infrared badge technology, said Patrick Meehan, an analyst at Gartner Group Inc. in Stamford, Conn. "This could be a functional aspect of every corporate desktop in America," he said.

But do employees feel comfortable being monitored? No one at Grainger has publicly complained about wearing the badges, according to Jere Brown, marketing manager. "There's almost a peer pressure to wear it," he added, speaking of Grainger's team-oriented approach.

ArialView doesn't monitor employees in the rest rooms, noted Jim Alland, CEO of Arial Systems.

But the system does track when employees enter and leave the building and who they're with.

No federal laws prohibit such monitoring, said Esther Roditti, a New York attorney specializing in high-tech law. However, companies should use common sense in notifying employees of any monitoring activity and maintain "reasonable standards of privacy" at work, she said, adding, "It personally disturbs me."

Audit Trails Might Have Fingered Los Alamos Insiders

Monitoring staff is key to security

BY ANN HARRISON

The biggest computer crime in history was an inside job. Though it occurred at a government laboratory, experts say many companies are also vulnerable to insider attacks.

U.S. Energy Secretary Bill Richardson last month confirmed that classified nuclear weapon computer codes at Los Alamos National Laboratory in New Mexico were transferred by a lab employee to an unclassified computer system. The incident has been at the center of allegations that China pilfered U.S. nuclear secrets to build nuclear warheads.

"Their monitoring systems were not as fully automated as they needed to be. Moving files from a classified to unclassified

environment should be an auditable event — you need to have a daily snapshot and intrusion detection happening in real time," said Rob Clyde, vice president of the security management business unit at Axent Technologies Inc. in Rockville, Md., which develops computer security tools.

A report issued earlier this year by the Computer Security Institute noted that 86% of respondents reported insider attacks, while 74% reported outsider attacks. Some reported attacks from both sides.

"Obviously, a disgruntled employee is a bigger threat than a hacker because he already has the access and insider information on how the process works, whereas a hacker comes in blind usually," said Dan Erwin, a specialist in security at Dow Chemical Co. in Midland, Mich.

Clyde recommended that

companies set up an audit trail system to track network managers who can deliberately leave security holes open for data thieves. Such systems should monitor firewall and operating system settings and track access to privileged accounts and files, Clyde said. An intrusion detection system should monitor security policies and immediately report any vulnerabilities, changes or addition of users.

"We have all these controls and capabilities, but usually, no one is looking to make sure that it is running properly," Clyde said. If a company suspects a manager is leaving holes open, Clyde suggests recording the user's sessions or keystrokes. Instead of firing the manager, Clyde advises patching the hole and watching to see if it happens again and if an attacker exploits the breach. If a pattern emerges, a company has a good chance of showing collusion.

"If they did damage, you want to have enough evidence to bring them to court," said Phil Schacter at The Burton Group in Midvale, Utah.

Face It, Your Best Talent Will Move On

CIOs: IT superstars will always job-hop

BY THOMAS HOFFMAN

Here's a novel approach to trying to retain hot-shot programmers: Just give up.

Superstar information technology employees are going to job-hop no matter what perks you throw at them, so it's best you accept them as transitional employees and get the most out of them.

So say veteran CIOs who spoke candidly about the issue at The CIO Forum, a conference for 400-plus financial services IT executives that was held aboard the *Queen Elizabeth II* earlier this month.

"We're going to have a class of employees who are going to

leave after a project," said Jonathan Nareff, vice president of IT at Fleet Capital Inc. in Glastonbury, Conn. "If you treat the company like a commodity, we'll treat you like a commodity," he added.

Besides, if a job isn't challenging enough, IT professionals — especially younger ones who aren't rooted — "will move on," said Helen J. O'Connor, director of IT management services at First Albany Corp. in Albany, N.Y.

Nicole Vanderbilt is a prime example. Upon graduating *Superstars*, page 45



NICOLE VANDERBILT took a substantial pay cut to move to a job "on the cutting edge"

WEB START-UPS NEED TO LEAVE TO SUCCEED

Corporate parents encourage Web counterparts to set up shop in Bay area

BY JULIA KING

AN INCREASING number of retailers are pushing their young Internet start-ups from the corporate nest in hopes they'll quickly learn new ways to fly online.

Eleven-month-old Macys.com, for example, is headquartered in San Francisco, thousands of miles away from its corporate parent, Federated Department Stores Inc. in Cincinnati.

So is OfficeDepot.com, whose brick-and-mortar headquarters is in Delray Beach, Fla. And just a few weeks ago, Paramus, N.J.-based Toys R Us Inc. announced plans to spin off an Internet venture and locate the new dot.com offspring in the San Francisco Bay area.

What's driving this trend, experts say, is retailers' growing recognition that selling in cyberspace requires an entirely different mind-set and skills from selling in the physical world. And what parents don't

know, they can't teach.

"Internet thinking is different. The speed is different and so are the technology and partnerships you embrace," said Dwayne Walker, president and CEO of shopnow.com, an online shopping portal.

"The Internet business changes radically every 90 days. For most big retailers, if they can change radically in a year, they're doing really well," Walker said.

And few places change faster than the Bay area.

"Being in San Francisco, we're closer to the pulse of what's happening with the Internet and more tuned in to what's going to happen 12 months from now," said OfficeDepot.com senior vice president Paul Gaffney. "If you're not out here, I think you definitely miss out on that

[knowledge]," he said.

Another big difference is how online and real-world retailers stock their virtual and brick-and-mortar outlets.

"Putting a garment in a store requires lots of different logistics than putting it online, which means you need differ-

The Internet business changes radically every 90 days.

DWAYNE WALKER, PRESIDENT AND CEO, SHOPNOW.COM

ent kinds of data and a different workflow," said Kim Miller, a vice president at Macys.com.

In a store, a dress must be placed on a hanger, which then goes on a display stand. Selling the same dress online requires no hanger or stand but lots of data to track when and where it will be shipped and how it will be paid for.

Other reasons for casting out new Internet retail ventures are more political than operational in nature.

Creating a separate dot.com subsidiary is a near-surefire way to attract the attention of Wall Street, which goes ga-ga these days over anything and everything Internet-related.

It's also a good way to attract top IT and marketing talent who may not otherwise be drawn to employment with a retailer, said Genni Combs, an analyst at Hambrecht & Quist in San Francisco.

"You can be sure that Toys R Us.com will have a different culture and will be issuing options to attract employees," Combs said. ▀

A Service to Combat Fraud

Used by banks, it's now available to retailers

BY STEWART DECK

HNC Software Inc. in San Diego has announced a service that will give Web retailers new tools for detecting credit-card fraud in Internet transactions.

Fraud has become less of a problem now that online retailers have real-time credit-card authorizations, said Elaine Rubin, chairwoman of Shop.org, a Silver Spring, Md.-based trade association for Web retailers. But those that sell quickly downloaded intangibles, such as software and music, still need better and faster tools for fraud detection than simple bank authorizations provide.

HNC's service, called eFalcon, is similar to the fraud-detection service the company already provides for nine of the top 10 credit-card issuers in the U.S. The service is built on neural network technology that sorts through volumes of transaction-level data for patterns of fraud and provides a

rank-ordered scoring system that users can adjust to set their own fraud parameters. Pricing for the service is based on transaction volume.

As part of the service, eFalcon users will give HNC access to purchase-level data, which HNC will use to continually refine its fraud-detection data models, said Wesley Wilhelm, director of consulting at HNC.

Analysts said HNC could eventually sell this valuable data on the shopping patterns of Web consumers, but Wilhelm denied that. "No, our focus is fraud," he said.

The eFalcon service could be one of the cornerstones of providing fraud protection for online merchants, said Joe Barrett, an early eFalcon user as co-founder of EC Direct Corp. The Seattle company provides e-commerce infrastructure for clients that include NBC and Microsoft Press.

"Because of HNC's reputation, this will go a long way toward building the credibility the Internet needs and give shoppers and merchants the same fraud-protection assurances," Barrett said.

"HNC knows this space well and has a rich technology base for fraud detection," said Allen Bonde, an analyst at The Extraprise Group Inc., a Boston consultancy. "They are certainly a company to keep an eye on in this area." ▀

Bar Keeps Rising in Privacy Debate

If companies don't follow Commerce guidelines, they could become law

BY PATRICK THIBODEAU
WASHINGTON

Having a privacy policy isn't enough anymore. Companies that do business on the Web may need to determine whether their privacy policies meet certain "fair information practices."

Those are a set of broad guidelines, outlined by the U.S. Department of Commerce and other agencies, that have become the new focus in the online privacy debate.

And that's because a recently released privacy study by Georgetown University in Washington found that only a small number of companies, about 12% of the 674 surveyed Web sites, follow all privacy practices.

"The bar is clearly being raised at a regular basis," said Mark Uncapher, vice president at the Information Technology Association of America. Those practices include giving users

a choice in how information collected about them is used and the means to review and correct it. Web businesses must also offer a specific privacy point-of-contact. Those practices are currently just advisory. But the catch is this: If companies don't voluntarily adopt them, they could become law.

March of the Bills

There are nine privacy-related bills pending and more possible in the U.S. House and Senate. Self-regulation advocates hope that Georgetown's finding that 66% of the Web sites surveyed have privacy policies will slow down the regulatory momentum. There's an industry push to get companies to adopt those fair information practices.

For instance, last October, Truste in Cupertino, Calif., a nonprofit online certification group, started requiring its

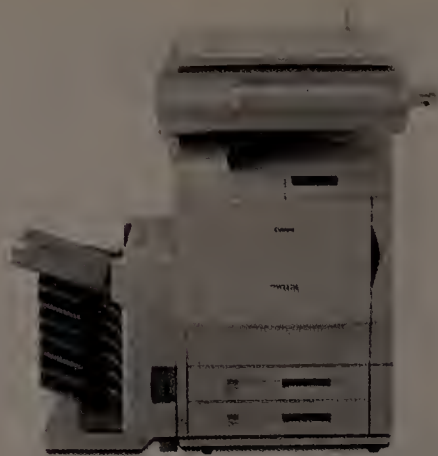
members to meet all the fair information practices.

Businesses are worried that congressional action could lead to "Miranda Warning-like" privacy regulations that could curtail e-commerce, said Pat Faley, vice president at the Direct Marketing Association in Washington.

For instance, Faley fears that a rule could be developed requiring companies to read their privacy policy to consumers before taking an order via telephone.

Privacy policies are important to establishing a customer's trust and giving him a "sense of security," said Marianna O'Brien, Internet relationship marketing manager at Eastman Kodak Co. in Rochester, N.Y.

And self-regulation isn't something to be taken lightly, O'Brien said. Companies that violate their own rules will suffer. "All you can lose is your good name and your trust and people's confidence in you... as you are raked through the media coals for privacy abuse," she said. ▀



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Social Security Y2K-Approved; Tests Go On

Recertification process is critical

BY TOM DIEDERICH

The Social Security Administration didn't halt its year 2000 effort when its system received the president's seal of approval in late December, officials said this month. But the agency nevertheless wants to assure its 51 million payment recipients that their checks will be in the mail Jan. 3.

"All of our software is Y2K-compliant, but we'll be changing it as we go through this year to implement new projects [and] the January cost-of-living adjustment," said Kathy Adams, the Social Security Administration's assistant deputy commissioner for systems. "We don't want to make changes and then put that code back into production without checking it or recertifying it to make sure it's still Y2K-OK."

The recertification process is critical, Adams said. "We want to make sure that as we change those systems we're not introducing any errors," she added.

"What we did was to determine what we wanted our recertification process to be, and then we evaluated which tools best supported that process. I think it's a mistake to go out and buy a tool and then try to figure out how you're going to use it," Adams said. The agency eventually chose Y2K vendor CCD Online Systems Inc. in Arcadia, Calif.

"We want to lock down our environment as we get closer to 2000, and so we will not be making any discretionary changes to our systems beginning Sept. 1. And that goes through March 2000 because we want to get through the leap-year processing in February," she said.

Mandatory changes will be made, however. For example, software that handles January's annual benefit-rate increase will be implemented in late November, she said. ■

BOSTON CELTICS SWISH REMEDIATION GAME PLAN

NBA club wrapping up season — and testing; 7-Eleven also on track

BY ANNE MCCRORY

THE BOSTON Celtics NBA season didn't go so well, but the organization said

it has a Y2K game plan in effect — and a fairly serious plan, at that. According to a recent filing with the Securities and Exchange Commission, everything from players' contracts to ticket sales are stored and handled by computer, either within the basketball organization itself or by third parties.

Read on for a glimpse at the status, costs and risks of Y2K planning at the Boston Celtics Partnership Ltd., as well as 7-Eleven Inc.'s latest revelations:

The Celtics' systems comprise an internal PC network and commercially available software.

As of March 31, the organization said it had identified, reviewed and fixed those systems.

It has now begun to do the same with the embedded systems contained in its leased properties, and in other non-IT systems. It has so far reviewed and

Business partners: The Celtics organization relies on third parties for ticketing, producing and broadcasting its basketball games and providing trans-

portation. Most of those suppliers said they have addressed their year 2000 issues. The partnership is evaluating those assurances for adequacy and accuracy.

Risks: The organization said risks can't be accurately estimated until its embedded systems have been tested.

However, the risks could presumably include the cancellation of games if transportation or operations at its game or ticketing facilities fail. Contingency plans will be developed if Y2K-failure risks are identified.

7-Eleven's Progress

The Dallas-based convenience-store chain uses computers for its merchandise ordering and receipt, petroleum products ordering and receipt, human resource and disburse-

ment systems.

Status: Internally, 85% of its systems have been fixed or replaced, with completion slated for June. Some 20% have been tested, with completion set for September. Contingency plans are 15% ready, with a target date of June for completion.

Business partners: Inquiries about their readiness have been sent to vendors in the merchandise, equipment, banking, insurance and public-utility sectors. Compliance is uneven.

On the supplier end, 60% have returned their questionnaires, though only 30% of third-party providers have done so. Half of all contracts have been reviewed. About 10% of partner contingency planning and development has been finished, with completion scheduled for June.

Vendor testing: Compliance testing with major vendors is being planned and is scheduled to begin June 1.

Cost: About \$8 million, of which about \$4 million will be equipment costs. To date, the company has spent about \$3.2 million.

The remaining cost for outside consultants, software and hardware applications will be funded through operating cash flow.

Worst-case scenario: Nothing more than temporary, isolated disruptions are expected. If product shipments are delayed, 7-Eleven should be able to offer comparable products. ■



BOSTON CELTICS rookie forward Paul Pierce

tested about half of them. All fixes are scheduled for completion by July 1, all at minimal (but unspecified) cost, the team said.

Are They Y2K-Ready, Or Not?

Study discovers 216 products drop in status

Infoliant Corp. in Pittsburgh, publisher of an online database that tracks the year 2000 compliance of vendor offerings, has reported that 604 commercial IT products changed their Y2K compliance status last month, up slightly from 595 in March.

Infoliant said that 216 — nearly 36% — of those products were downgraded to non-compliant status or labeled ei-

ther "action required" or "vendor will not test."

A statement from the company said that products' Y2K readiness can change as new bugs pop up or as evidence is found that patches didn't fix all known bugs. The statuses of some products have changed as many as nine times since the company began tracking year 2000-readiness in November 1997.

— Rick Saia

SNAPSHOT

Competitor Comparison

Here's how the two leaders in the scientific, photo and control equipment industries were faring with their year 2000 work through 1998:

	3M	EASTMAN KODAK
Fortune 500 rank	103	121
Costs	\$53M	\$40M
Estimated total Y2K costs	\$86M	\$58M
Notes	Expected to finalize all contingency planning by the end of last month	Expects manufacturing control systems to be compliant by midyear

SOURCE: COMPANIES' 10-K FILINGS WITH THE SECURITIES AND EXCHANGE COMMISSION

MANAGING CONTRACTS

Health firm tracks discounts with 'next wave' of ERP

BY CAROL SLIWA

PREMIER INC.'S group purchasing organization spends \$11 billion per year on pharmaceutical, medical and surgical, and capital goods for 1,800 hospitals.

The need to better track and analyze those purchases prompted the San Diego-based company to seek out a contract management system.

When the system goes live in September, Premier will become the first major group purchasing organization to use a contract management system

from Systems Consulting Co. (SCC) in Portland, Maine. Traditionally, SCC's customers have been the pharmaceutical companies that sell products to the hospitals and other institutions.

Until recently, many companies have been managing contracts that often can be quite complicated — with varying levels of discounts built in to them — via homegrown systems or spreadsheets, said John Hagerty, an analyst at AMR Research Inc. in Boston.

Companies may check the data on those spreadsheets periodically, but in many cases, they're left saying, "I guess

we can't tell 'em what's going on, so we'll have to pay 'em," Hagerty said.

But as more companies install enterprise resource planning (ERP) backbones, they're getting the level of data they need to effectively track promotions and rebates. So now they're considering contract management systems — such as SCC's parameter-driven process that can handle complex rules — "as kind of the next wave of ERP," Hagerty said.

Manual System Couldn't Handle It

After Premier underwent a merger more than three years ago, the company opted for the old manual-oriented system of one of the merged companies to track its volume of purchases. But that system couldn't handle the added volume brought on by the merger and didn't give the company the level of detail it wanted for contract analysis, said Joe Pleasant, a senior vice president for

information systems at Premier's Charlotte, N.C., office. He declined to say how much the system cost.

Premier negotiates contracts with manufacturers to guarantee pricing for its hospitals. Variable discounts can kick in as the hospitals meet certain purchasing levels. To make matters more complicated, those products get delivered by a distributor, and in some cases, Premier also manages the contracts with the distributors.

Disputes can arise when a manufacturer claims a purchase is ineligible for the special pricing. If a distributor is involved, there can be additional complications, because the distributor may not have access to the hospital's lower contract pricing. "That's one of the reasons you need a system like this: to be able to keep track of all the components of a contract," Pleasant said.

With the new contract management system, Premier expects to be able to better ensure that contract pricing is applied, contract terms are met and volume purchases are credited to the right institutions. ▀

Microsoft Music Partner Lures Executives From AT&T Unit

BY MARC FERRANTI

Reciprocal Inc., which is developing Internet music distribution software with Microsoft Corp., has scored an industry coup by hiring the management team of AT&T Corp.'s music unit A2B Music.

About half of A2B Music staffers are leaving the company to join Reciprocal, a company formed in 1996 that develops technology for managing digital rights and that recently announced a \$15 million investment from Microsoft.

Larry Miller, former CEO and co-founder of A2B, is now president of Reciprocal's new division, Reciprocal

Music, which was launched last week and will be based in New York.

Miller declined to discuss details of the incentives that Reciprocal offered the A2B management team.

A2B has pioneered the downloading of copy-protected music from the Internet among major label record companies as a way to move sales of CDs through traditional retail outlets.

Reciprocal has taken only staff, not technology or other assets, noted Kevin Compton, an AT&T spokesman. ▀

Ferranti writes for the IDG News Service.

Continued from page 40

Superstars

from Princeton University in 1995 with an engineering degree, Vanderbilt joined Deloitte & Touche LLP as an IT consultant. She wanted to work on "exciting" technology projects but was assigned to mundane year 2000 and systems management jobs.

The frustrated twentysomething systems engineer bolted after less than two years for a substantial pay cut to join New York-based Jupiter Communications Inc., where she analyzes consumer behaviors on the Internet. "Being on the cutting edge was far more appealing to me" than money, she said.

Because employees aren't nearly as loyal to the companies they work at as they were, say, 30 years ago, CIOs have had to change their approach to manag-

ing them. "If I can get someone to stay for two years, that's terrific. It would be ludicrous to think that someone's going to stay with the company for 20 years," said Bernard Lachner, a director at Trident Data Systems in Los Angeles.

Still, IT management may be overlooking some of the factors that keep employees onboard. For example, IT employees "want a feeling of belonging, ownership of a job or a team pursuit," said David Foote, managing partner at Cromwell Foote Partners LLC in Stamford, Conn. They also want internal mobility, constant skills refreshment and career advancement opportunities, he added.

However, treating one set of employees like superstars can alienate others. "We've had tremendous backlash from [nonstar] employees who didn't get a 15% to 20% salary bump," said Carol Teasley, vice president of systems integration at Fannie Mae in Washington. ▀

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Erran Carmel: Understanding foreign cultures is a key to making global software teams work.



KATHERINE LAMBERT

Round-the-World Teamwork

Erran Carmel studied for three years how 17 major companies manage global software teams. The associate professor at American University in Washington has published his findings in a new book, **Global Software Teams: Collaborating Across Borders and Time Zones** (Prentice Hall PTR, Upper Saddle River, N.J.; 208 pages; \$39; paperback). Freelance writer Rochelle Garner spoke with him about his findings.

If you could single out one or two cultural differences that have the greatest impact on cross-national teams, which would they be? The first would be how each culture reveres hierarchy. In some cultures, people listen to superiors very care-

fully before they will express an opinion. Studies show that Russia, China and Indonesia have a high regard for hierarchy. Other cultures revere equality. These include Israeli, German and American cultures. Those differences will manifest themselves in personal initiative.

Another key cultural element revolves around the notion of high-context vs. low-context communication. Low-context cultures [notably American, Northern European and Australian] use language very precisely. Language is the principal means of communication. This is in contrast to high-context cultures such as those found in Japan, China, Latin America and India. Here, the major component of communication is in the context: people's surroundings, past and present events and in the relationships between people. These cultures want to build a relationship first, and then they trust.

Can you give some examples of how cultural differences might manifest themselves in a development team?

All specifications have implicit mental and value assumptions that are understood by one culture, but not necessarily another. That becomes an issue when you hand off specifications to a culture that doesn't understand business, say, or the components of an advanced consumer culture. This applies particularly to India but also to Russia. That means everything has to be very carefully specced out.

How does a project manager cope with different time zones, languages and cultures? The key lies in creating some methodologies and formalities for communication. There are certain protocols for how to write an e-mail that are critical when

dealing with people whose native language is not English. The first is to purge cultural idioms, like "apples to oranges," which others find hard to understand. Beyond that, managers should direct team members to acknowledge every e-mail within one workday and to avoid sending messages to multiple recipients unless it's absolutely necessary. E-mail headings should be descriptive, and the message body for administrative messages should follow agreed-upon templates. And e-mail senders should state explicitly the sort of response they expect.

It's important to remember that effective communication is through multiple channels, with a lot of redundancy. What was concluded with a phone conversation should be replicated in e-mail. And people should repeat back what they think they understand.

Your book addresses the vital importance of occasional face-to-face meetings - at project kickoff, at various milestones and to celebrate completions - with all team members. Is this something a company must budget if those cross-national teams are to work? For a long-term project, periodic face-to-face meetings are recommended. Such get-togethers create relationships, relationships lead to trust, and trust leads to more effective teamwork. There's no getting around travel with a global team. Some people need to travel almost all the time. These include specialists and the project manager. But it also makes sense that some specialists be rotated to different sites for months, if not years, at a time.

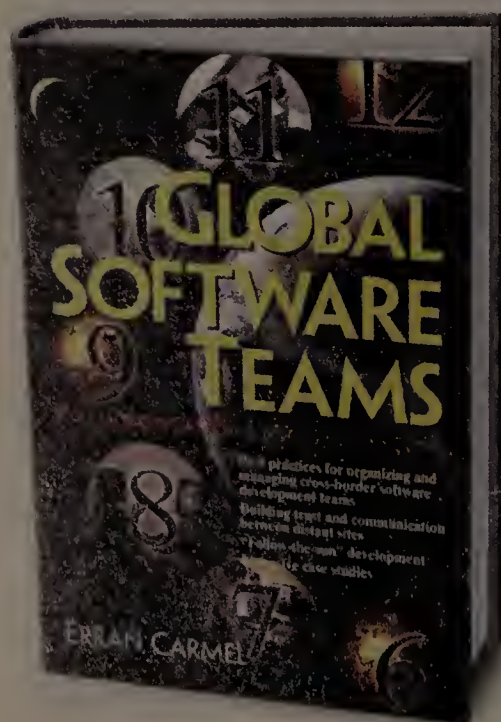
You also write about virtual retreats as a way to build relationships across boundaries. Can you describe the practice and why it's valuable? I would classify the virtual retreat as one of the many metaphors from the real world where people sit around a room and talk about themselves. This can be done with discussion groups and with chat rooms in teams that are in similar time zones. The point is not to talk about everyday problems with the project. Instead, they talk about their personal lives to establish [a] relationship, and they talk about the larger issues in the project.

Managers should encourage that participation, since it requires a lot of selling up front - with the manager contributing interesting and exciting posts that get others to join in.

What's the role of the cultural liaison? It's a fuzzy role, but it's someone who acts as an important conduit of communication between the two most-prevalent cultures [on a team]. In India these days, that person is usually an Americanized Indian who had spent years in the U.S. and is sent back to manage a project. Many cultural liaisons are higher than the project managers.

Is there any piece of advice you would give companies about to launch global software teams? Everyone on the project team dealing with anyone outside the immediate unit needs to understand something about that other culture. That's why I recommend that everyone receive some form of cultural preparedness training, taught by professional cultural trainers. ▀

Garner is a freelance writer in San Carlos, Calif. Contact her at rrgarner@pacbell.net.



NEWS BRIEFS

Pratt & Whitney Hands IT to CSC

Computer Sciences Corp. in El Segundo, Calif., has announced a 10-year contract with Pratt & Whitney worth about \$1.2 billion. Under the agreement, CSC will manage Pratt & Whitney's engineering, manufacturing and business systems including engineering and desktop applications, Unix and Windows NT servers, help desk and voice, video and data networks. About 650 Pratt & Whitney employees will join CSC. Pratt & Whitney's information technology staff will be reduced to about 45 people.

Investors Online Look, Don't Buy

Although 12.8 million Americans are tracking their investments online, 4.5 million are actually buying and

selling stocks in cyberspace, according to a survey of 16,500 households and 550 bankers by Dataquest in Norwalk, Conn. When asked why they don't buy or sell stocks online, 45% of investors said they saw no need to, and 34% said they were worried about privacy/security issues.

SNAPSHOT

Public Sector's IT Hiring Woes

Top three barriers to recruiting IT staff in the public sector:

- Low base salary
- Inability to reward or give bonuses
- Lack of advancement opportunities

Base: 342 hiring managers in government agencies

SOURCE: INTERNATIONAL PERSONNEL MANAGEMENT ASSOCIATION, ALEXANDRIA, VA.

NEW REPORTS

Online Trading to Change Industry

The number of online brokerage accounts is expected to increase fivefold by 2003 and will change the face of the investment industry, according to a new report from Cambridge, Mass.-based Forrester Research Inc.

To meet the needs of those more "mainstream" investors who seek advice, trade less frequently and prefer mutual funds, financial firms must update, the report said. "Net Investing Goes Mainstream" estimates there were fewer than 4 million online accounts early this year. By 2003, 9.7 million households are expected to have 20.4 million accounts.

Reports are by subscription. www.forrester.com

Java Use on Rise Overseas

Java use is increasing substantially among international developers, according to new research from Santa Cruz, Calif.-based Evans Marketing Services.

The marketing company's April survey of 340 developers in more than 60 countries - titled "International Developer Opinion Survey" - showed that 40% of that group uses Java, up from 30% in September's survey.

In the North American version of the survey conducted during the same time frame, Java use remained flat, at 43%.

The 200-page report is available as part of a subscription.

www.evansmarketing.com

The world isn't small enough — yet

JIM CHAMPY

THE "GLOBAL ECONOMY" is a myth.

I don't know who first dreamed up the phrase or what they really meant by it, but just try to move your product or service from one country to another. Yes, information zips through the ether faster, people are

more mobile and UPS, FedEx and DHL operate in more countries these days. But the only thing that really seems "global" about the world's economy is that when one country has a financial hiccup, it can affect the economy of another. That's because there is more trade among countries, and we lend one another a lot of money.

Why does this myth matter? Because today, the Internet really makes a boundaryless marketplace possible — possible, but not yet a reality. My wife and I experienced this recently when we wanted to buy a piece of furniture we had seen in a European magazine. It was a ready-made catalog item. No special manufacturing was required. So we followed our now normal practice of searching the Web for the manufacturer's page. We found it and also found our way to the company's U.S. representative. But that's where our global experience stopped. To get what we wanted would have taken lots of paperwork, lots of bucks and months of waiting. It was hardly an easy or pleasant customer experience.

We really don't operate in an open global economy, so a company's technology and distribution strategy is also affected.

Recently, I saw the dilemma from the supplier's point of view. A client had built a successful e-commerce site for its products here in the states. But the question now is how to expand into Europe and Asia. Certainly someone from Paris or Bangkok could dial in to its U.S.-oriented site, but processing the orders wouldn't be easy, and there were questions about whether the business practices that worked in the states would be accepted by buyers in other countries. The only workable strategy might be to set up a site for each country and forgo creating a global logistics capability — which seemingly contradicts the idea of the "World Wide Web." All this suggests to me is that the Web may be only an electron deep.

Here are my thoughts on the breakthroughs

required to build a global Internet Age economy and what you can do about it.

First, follow the principle that we learned a long time ago: Adhere to local sales and marketing customs. I'm reminded of the simple question that I get from the ATMs in my neighborhood: Do you speak English or Spanish? Offer your customers choices of not only language, but business practices. The French have a penchant for lots of useless paper, so print out shipping documents and fax them. Don't be so American as to assume that we set the business rules.

Assuming that you can get the order, the next challenge will be to deliver it — at a cost acceptable to the customer yet that still allows you to make a profit. I believe that the biggest barrier to large-scale e-commerce lies in logistics, not in communications and IT. Logistics companies still don't make a profit on many home deliveries, mainly because often no one is home. Eventually, either the shipper or the customer will have to pay for the loss.

Doing business across borders either with consumers or companies adds to the costs and challenges. But I see this as an opportunity. Who will invent the global equivalent of what FedEx first did in the U.S.?

But the biggest obstacle to global commerce still lies in trade barriers. The formation of the European Union makes it easier for its members to trade amongst themselves, but it's raising even more protectionism toward non-European companies trying to sell to Europe.

So the next time you hear President Clinton or Congress take on trade issues, get a bit more active. IT makes a real global marketplace possible. Now we have to perfect it. ▀

Adhere to local sales and marketing customs.



Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. He can be reached at JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

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THE BLACK HOLE OF PAYROLL

IT consultants with top skills continue to get filthy rich. Meanwhile, it seems like mediocre consultants feel entitled to the same high pay
By Leslie Goff

JOANNE LEAVEY knows what it means to go the extra mile to sign up a new consultant. As a recruiter at the Sheridan Consulting Group in Melville, N.Y., Leavey last year found herself driving all over Long Island looking for a car and an apartment for an SAP consultant who was relocating from out of state.

"It had to be a four-door, midsize economical car, and the apartment had to be in a good school district," Leavey recalls. "And both had to be within a certain budget. I had to work nights and weekends to find them, and I put a \$50 deposit on one place that I never got back."

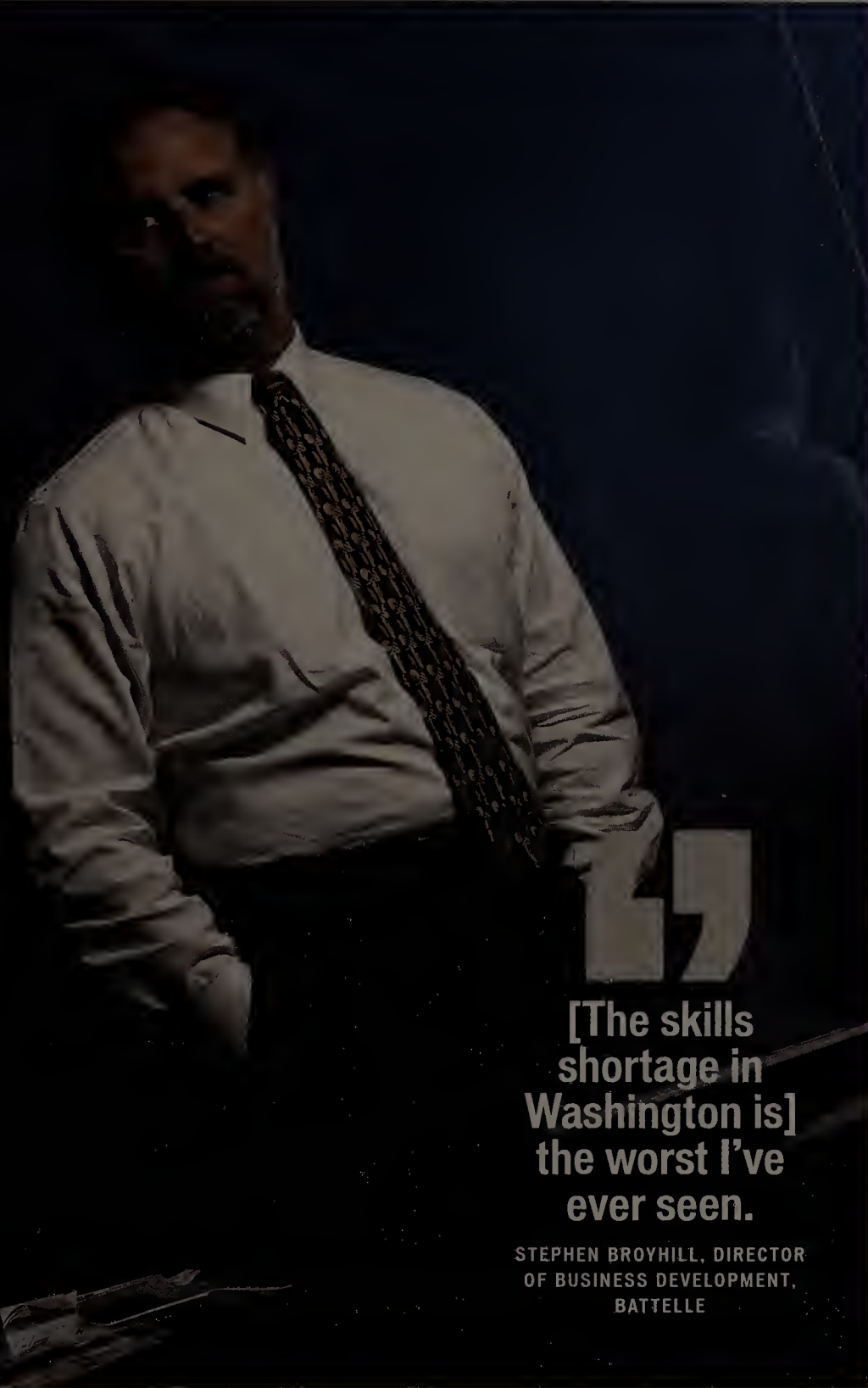
But her client, a large, prosperous and loyal customer, wanted the consultant and was willing to pay "a tremendous fee," Leavey says. "So even if time is money, we still made a profit on the deal."

It seems that even skyrocketing salaries aren't enough to pull in a good consultant. Offer them the

moon and the stars, and they're apt to ask you to throw in the sun and the clouds while you're at it. Consulting agencies have fallen into a black hole, infinite and vast judging by the increases in salaries and bonuses reported by 250 firms in *Computerworld's* second annual Consultants Salary Survey. In five out of six consulting job categories, paychecks soared last year over 1997 by roughly 25% for entry-level consultants to as much as 240% at the senior partner level.

In one-on-one interviews with several survey respondents, they report average base compensation increases of between 10% and 20% but say both the quality and quantity of bonuses are also on the rise. And like Leavey, they say consultants with skills on the "Most Wanted" list (see story, next page) and the right mix of technical know-how and business finesse aren't only driving up wages; they're soliciting some exceptional perks to come on board.

Another SAP expert, after receiving a written offer, demanded 10% more than the stated salary, plus relo-



[The skills shortage in Washington is] the worst I've ever seen.

STEPHEN BROYHILL, DIRECTOR
OF BUSINESS DEVELOPMENT,
BATTELLE

WALTER CALAHAN

cation expenses, stock options and a signing bonus. And a consultant who had prior experience with an agency's key client received a six-figure salary, four weeks' paid vacation and a \$10,000 signing bonus.

Covering relocation expenses for consultants has become the rule rather than the exception. Many agencies are taking care of all the paperwork and expense of securing H-1B visas for foreign nationals. Some are even reimbursing recruits for money they owe their former employers for training expenses.

Sometimes getting a desired person on board is like "negotiating to buy a used car — offer, counteroffer, counter-counteroffer and so on," says Aileen Yelle, human resources administrator at consulting firm Nichols Infotec in Jackson, Miss.

Stephen Broyhill, director of business development at Battelle, an information technology consulting firm in Arlington, Va., says he's heard some "phenomenal" requests, like \$250,000 salary for a position usually paid \$100,000.

And Jim Raihall, a senior technical recruiter at Innovative Consulting Inc. in Malvern, Pa., has had relative novices ask for 30% above their salary just because they "have two friends who are making that much."

The dramatic growth and outrageous requests follow what's perhaps the only law more reliable than Murphy's: the law of supply and demand. Last year's frantic year 2000 push, coupled with enterprise resource planning (ERP) implementations, e-commerce expansion and the scramble for Oracle Corp. software expertise, hit agencies with the force of a typhoon. Trying to recruit and retain the talent they needed without raising salaries and adding bonuses was like running into gale-force wind.

It's not that there aren't bodies out there — it's that there aren't qualified bodies out there, agencies say. Lured by reports of the IT labor shortage (or skills crisis), it seems that anyone who's ever sat in front of a computer goes knocking on agencies' doors.

CONSULTANTS, TAKE NOTE:

Thank you goes a long way

Of the 400 candidates he has interviewed during the past several years, only five have sent Tim Bradshaw thank-you notes.

The staffing specialist at Interim Technologies in Houston says that grand oversight is an indicator of why so few of the people applying for consulting work are truly qualified to join the field: They just aren't deft communicators.

"Some people are so technical, they don't have the personality for consulting," Bradshaw says. Of the five gracious candidates, two lacked the requisite résumé for the job, but three were hired without hesitation.

"We were very impressed with their personalities," he explains.

Don't Try to Write Yourself Into a Job

Agencies are getting hip to a common consulting ploy: writing undocumented code that only the original developer can decipher, guaranteeing him lucrative follow-up work when glitches turn up later.

After one expensive lesson in this well-practiced art, Sheridan Consulting Group in Melville, N.Y., established a policy requiring consultants to turn over all their source code and documentation when a project is completed.

"Everyone writes code differently, and a lot of it's not documented," explains Joanne Leavey, Sheridan's recruiter. "This one guy wrote a program that only he could make run. If there was a problem, he would demand double his usual rate to go in and take care of it, and there was nothing I could do but pay it. Now, we do things differently."

Most Wanted: A Skills Smorgasbord

Outside of demand for year 2000 skills, which is already starting to wane, Oracle, Internet and ERP skills top the "Most Wanted" list, consulting agency recruiters say.

All the most wanted skills command uncomfortable-to-pay salaries, but consultants with combination skills set the curve. Applications developers with object-oriented programming and e-commerce experience can earn as much as 20% more than a less-skilled developer, Bradshaw says. And SAP consultants are garnering fat sign-on bonuses and other perks, says Aileen Yelle, human resources administrator at consulting firm Nichols Infotec in Jackson, Miss.

But as IT managers' attention shifts from migrating legacy systems to the projects they've had on hold, there's very little that doesn't make the list:

- Oracle
- Web development, e-commerce and electronic data interchange
- SAP and other ERP packages
- Object-oriented programming skills applications development tools, including C++, Java and Visual Basic
- Network architects, engineers and administrators
- Data warehousing and online analytical processing tool development
- Lotus Notes
- IBM's AS/400
- Microsoft Corp.'s SQL Server
- Unix

— Leslie Goff

Salary Survey, page 54



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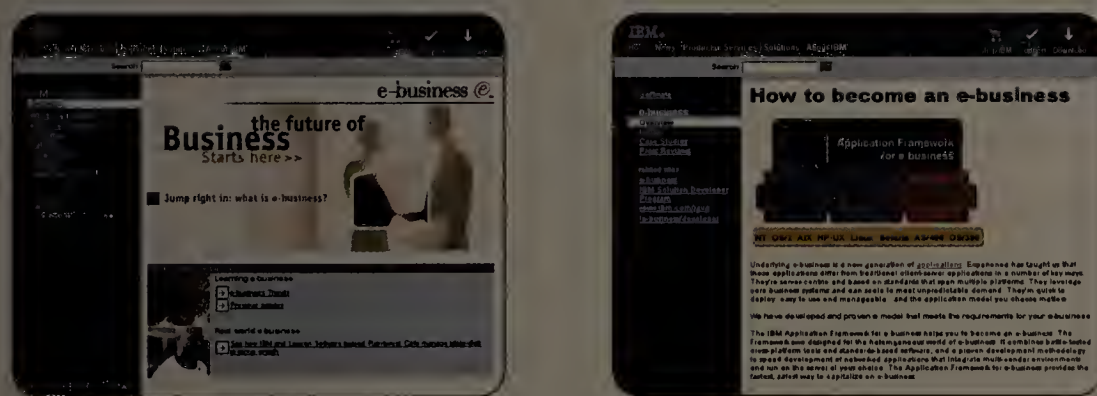
IBM e-commerce software powers the REI online store — and sales that exceed projections by over 360%. Can IBM e-commerce software help you?

IBM software is helping thousands of companies build, run and manage powerful interactive e-commerce Web sites. For REI, that means everything from state-of-the-wilderness gear you can buy to clinics on outdoor skills, enthusiast bulletin boards and a world of trips and tours. The scope of REI's offerings led them to IBM.

IBM software provides the building blocks for all facets of e-business, including secure payments, electronic catalogs, and order processing. For REI, proven products, such as Net.Commerce, DB2® Universal Database™ and IBM Firewall deliver the scalability, reliability and security it takes to reach, sell and service a growing community of outdoor enthusiasts.

The results have been nothing less than astonishing. In the first quarter alone, REI's sites generated online sales that exceeded projections by over 360%. And these e-sales are 4 times the size of those in their brick-and-mortar counterparts. Bottom line, REI is growing profits far beyond its wildest expectations.

REI is just one example of the thousands of e-commerce businesses IBM software has helped build and grow. From Web storefronts to integrating your business systems and supply chains, IBM offers a breadth of software products simply unmatched by anyone. All backed by the know-how and support of IBM and its Business Partners.



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LINA FAFARD/CAREER COUNSELOR

New Career Chart Topppers

THE DAYS OF THE SPECIALIST are over — bring on the generalist. The e-commerce tidal wave has spurred IT shops into providing full-service offerings via the Internet for the business products and services they support. The Internet's success has caused a new customer focus on data communication as opposed to verbal intercourse.

The result: a number of new IT concerns, crises, projects and job opportunities. Current and future critical information technology projects call for multitalented professionals with skills in areas such as the Internet, networking, data security, data warehousing and "sticky" Web content development (keeping the customers on the site and creating value to keep them coming back). For IT professionals trying to chart their

career paths, Internet experience is a hot commodity these days — and it most certainly will be a minimum requirement in the near future.

The Net era requires a broad range of expertise in every position. Here's a look at the best jobs to invest in and what they require:

■ Internet Specialist

Salary range:
\$75,000 to \$85,000

This position requires skills in senior-level networking, LANs and WANs, the Internet, security, e-commerce, Unix, Windows NT and Novell applications. You must be able to communicate effectively, possess an outgoing personality and enjoy working with users. It's a high-level technical post; the next step up is team leader or manager.

■ Windows NT Systems Architect

Salary range:
\$60,000 to \$80,000

Increasingly, IT shops are connecting via NT technology, making it imperative to have one person who can wrap his arms around the entire project and address topics like net-

work design, network management, security, scalability and performance. You must have a background as a senior network engineer with solid NT troubleshooting skills, excellent detective abilities and team-player attributes. The next stop on that very senior technical path is management.

■ Cross-Platform Security Specialist

Salary range:
\$100,000 to \$150,000

You'll function as the resident end-to-end network and data security specialist; your primary responsibility is to ensure there are no leaks. The job requires a strong networking background, firewall expertise and the ability to make the applications safe but not too cumbersome. If you have a strong background in applications programming, network technology, the Internet and security, this is the job for you. Depending on your ability to sell your concepts, the next stop may be technology strategist.

■ Web Designer/Site Builder

Salary range:
\$60,000 to \$100,000

To build the spiffiest site in the competitive marketplace, you'll need Web-site development skills such as C++, Java and HTML. You'll support the information, automation of customer service, help desk functions, ongoing develop-

ment and maintenance. You'll need a strong understanding of the business you'll be supporting and lots of intuition.

People will constantly complain about the site, so strong prioritizing and customer service skills are also critical to your success in the position. But because of the high visibility of the job, your work won't go unnoticed. It usually involves project work and consulting is common — it's a unique position. The next stop is the Web strategist's post.

■ Web Strategist

Salary range:
\$65,000 to \$125,000

This position also calls for a unique person — someone who has a strong understanding of the business, technical skills and a marketing vision — to work with the Web-site builder. You'll provide "sticky" Web content. You'll also keep an eye on the competition to maintain a leading edge. You'll work very closely with the technical strategists and department heads to communicate the services effectively. It's the kind of high-visibility position that can open other technical leadership and strategy doors.

■ Technology Strategist

Salary range:
\$130,000 to \$150,000

To perform this job, you'll need a breadth and depth of technical knowledge across all

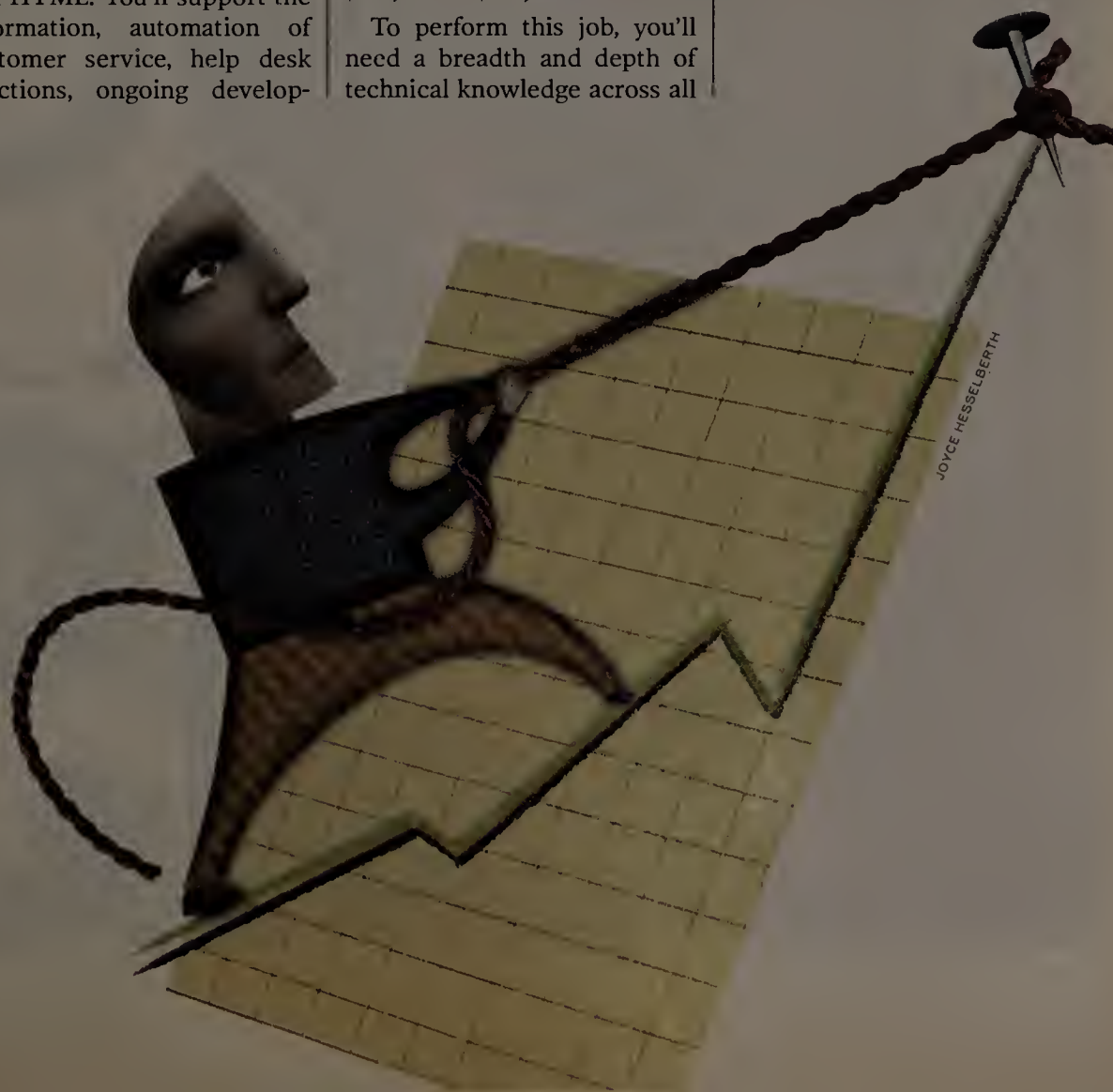
platforms. You'll need to focus on the future; be able to transition old technology to new systems; show expertise in networks, the Internet, operating systems, operations and applications; and demonstrate business savvy. Next stop is chief technology officer.

■ Chief Technology Officer

Salary range:
\$200,000 to \$250,000

Next to CIO, it's the highest post in an IT organization. The chief technology officer manages and plans technical standards across the organization and tends to the daily, high-level IT issues. You must be a forward thinker who understands the business being supported. You'll also find ways to enhance service. Understanding the numbers is a critical facet of the position, as is knowing when and where to take business risks. The prerequisites for the position are a background as a technical strategist — knowledge that's a mile wide and a mile deep — and an outgoing, magnetic personality. ▀

Fafard is research director and branch manager at Montgomery West in Torrance, Calif. She can be contacted at lfafard@montgomerywest.com.



LAST NOVEMBER, San Francisco-based GreenTree Nutrition Inc., which runs an online vitamin store at www.greentree.com, redesigned its Web site to make it more user-friendly for older shoppers. Now, with one click, users can get to a section of the site devoted to seniors, says marketing director Tim Hogan. There they can research health conditions and find out what dietary supplements can be used for treatment or prevention.

Separately, Healthgate Data Corp. (www.healthgate.com), a Burlington, Mass.-based Web publisher of health information, is gearing up for an August launch of a new webzine called *Healthy Senior* that will be syndicated on multiple health care sites.

The company already offers The Senior Health Advisor, a free service where people can submit health questions to be answered by experts.

GreenTree and Healthgate don't know what percentage of their online customers are over the age of 50, but chances are it's substantial.

According to Jupiter Communications Inc. in New York, there will be 7 million people age 50 and older online by the end of this year. When it comes to shopping online, "this group is running neck and neck with their younger

counterparts," says Fiona Swerdloe, an analyst at Jupiter.

Altogether, 68% of online buyers are over 40, according to a survey by Ernst & Young LLP and the National Retail Federation. Older Americans have the time, the money and the motivation to shop online. Lugging heavy items, or even getting out of the house, may not be as easy for them as it once was.

As a result, online merchants are scrambling to woo this audience. In doing so, they're confronted with some interesting challenges. Should they single out older Web surfers, and if so, how?

According to experts, the answer depends on what you're selling.

Generally, the Web is a behavioral medium, says John Jordan, director of e-commerce research at Ernst & Young in Cambridge, Mass.

"The behavior is what matters," Jordan says. "Companies should be paying attention to what people do on the Web, not who they are."

By observing its customers, GreenTree learned that older shoppers had a higher need for information than their younger counterparts. "But they want that information presented in a simple way," Hogan says. That's why the company allows Web surfers to easily reorganize the site to highlight products that are more likely to be of interest to people over the age of 50.

Simplification was also in order

HOW TO ANNOY OLDER ONLINE SHOPPERS

1. Repeatedly refer to them as "seniors."
2. Load your Web page with small type and flashy graphics.
3. Refuse to provide lots of content for them to research their purchases.
4. Make your site load slowly.
5. Talk down to them or single them out for their inability to comprehend the site or the security behind e-commerce.

when it came to product selection. "We have 99 [different types] of vitamin C," Hogan says. "That can be overwhelming to anybody." To make it easier for shoppers, the company recently began highlighting three products in each category — GreenTree's pick, a market favorite and a best value.

GreenTree's Web site also has a lot of information about conditions "for which there is no magic pill," Hogan says. For instance, lots of older men are concerned about prostate cancer. On GreenTree.com, you can read about the risks, but "we won't try to sell you anything," he explains.

It turns out that what older Americans want is generally the same thing that everybody else wants from the Web — security, good values and intuitive, fast-loading pages.

In a recent Jupiter survey, people over 50 were asked what would most help them to purchase online. "They said 'finding good deals,' 'finding what I'm looking for' and 'credit-card security' — the same three things that younger people cited," Swerdloe says.

Seniors can have special needs, though. "It may be more difficult for them to see," says Don Lowy, president of The Senior Network, a Stamford, Conn., firm that helps companies market to older Americans. "Web merchants should be using bigger print" for seniors, Lowy says. Keep the site clean and easy to read without a lot of distracting motion and sound, he advises.

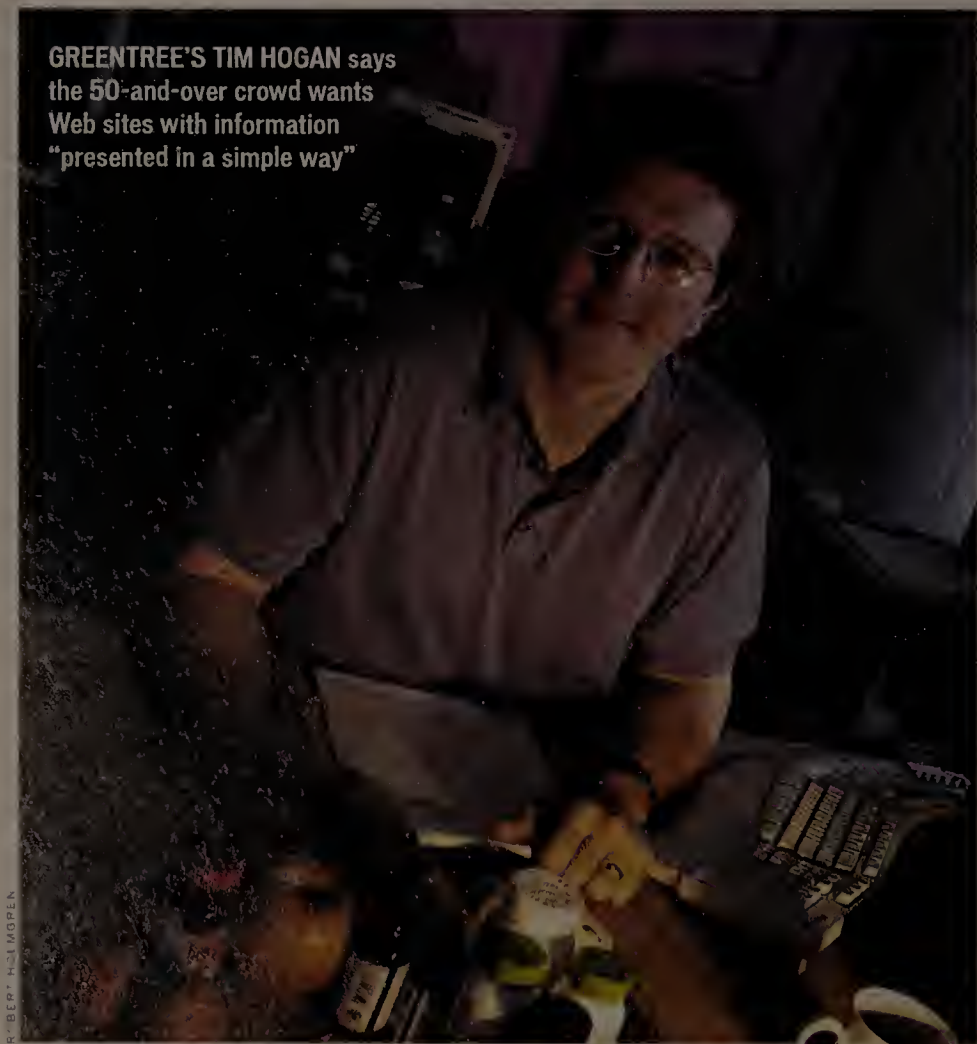
"I like fast-loading sites," says Larry Larsen, 57, of Los Altos, Calif., who has recently purchased books, software and a treadmill online. "It really irritates me when I go to a site and it takes 20 seconds to load." Another annoyance, he adds, are "sites that try to put too much information on their home pages. Larger print would be nice, too."

Because members of the mature audience have more time than their younger counterparts, "information is king," Lowy says.

"I agree with that," says Larsen, a self-

GREENTREE'S TIM HOGAN says the 50-and-over crowd wants Web sites with information "presented in a simple way"

SENIORS



described information junkie. For a recent new car purchase, Larsen used the Web to compare two models for "several hours a day for at least a week."

Brokerage Charles Schwab & Co. in San Francisco recognizes the importance of older Web surfers but has stopped short of redesigning its Web site to make it more appealing to the 50-and-over crowd. "We're focusing on educating this market," says Dan Hubbard, a Schwab spokesman. Schwab has an alliance with SeniorNet, a San Francisco organization that provides computer assistance and training at more than 150 sites across the U.S. The brokerage provides SeniorNet with educational information on investing via the Web.

CD-Now Inc., a Fort Washington, Pa., online music store (www.cdnow.com), also believes that alliances are key to reaching the older audience. The company has a strong presence on ThirdAge.com, a Web site run by ThirdAge Media Inc. in San Francisco. One of several sites aimed at older people, ThirdAge is looking at ways to market directly to seniors via e-mail. "If you can create a comfortable shopping experience, this group is not a hard sell," says Michael Crotty, director of marketing at CD-Now. To that end, CD-Now has started offering music from the 1950s and '60s that older shoppers may have owned as records but not yet replaced as CDs. "Lots of older Ameri-

cans feel out of place in big, loud, music retail shops that cater to younger buyers," Crotty says. At the same time, he adds, they like to give music as gifts.

Overall, Web retailers have to walk a fine line to appeal to the 50-and-over crowd without putting them off. Swerdlow says merchants should play up the convenience of online shopping because this audience "might not be as mobile," but they must be careful not to talk down or insult the group.

"These people think of themselves as young," says ThirdAge founder and CEO Mary Furlong. "The word *senior* really doesn't work anymore," she says. Many older Americans, she adds, work past retirement age, enjoy good health and lead active lifestyles.

Older Americans don't appear to be any more reluctant to use their credit cards over the Web than younger people. But building a sense of trust — and affiliating with trusted brands — is important to this group, Furlong says.

Seniors are a savvy user group, adds Rick Lawson, vice president of content at Healthgate. "We don't dummy down our information. They are vocal users with strong buying power. Treat them like you would your mother." ▀

Cole-Gomolski reports on IT labor issues and the health care industry for Computerworld. Contact her at barb_cole@computerworld.com.

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► Today's Comic
► Today's Crossword
► Today's Horoscope
► Today's Joke
► Today's News
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THIRDAGE.COM is one of several Web sites aimed at surfers who are over 50

TARGETING SENIORS: NOT FOR EVERYONE

Not all Web merchants are segregating seniors.

Roger Wood, vice president of e-commerce and direct marketing at Reebok International Ltd. in Stoughton, Mass., says it would be a mistake for the athletic shoe and clothing manufacturer to do that. "When it comes to food or clothing, you are talking about taste," he says. "In these categories, people who are 45 wish they were 25, and people who are 15 wish they were 25." Because food and clothing suggest something about your identity, "people tend to aspire and have dreams about that point in life," Wood says. So don't expect to see images of older Americans modeling athletic shoes on Reebok's site.

For Austin, Texas-based Garden Escape Inc.,

which sells plants, seeds and gardening tools at www.garden.com, the choice to not target older Americans is based on conserving precious corporate resources. "Every time you fragment your site, it involves products, promotions and content, and that can mean 10 to 15 people," says Andy Martin, vice president of development and chief technology officer. Right now, that's a luxury that the 100-person company can't afford.

Most users at Garden.com are between the ages of 45 and 55, but purchases seem to be driven "by seasons and zones" more than age, Martin says. "We do see more older people in our chat rooms, presumably because they have the time." — Barb Cole-Gomolski

ING TO IORS

Millions of older Americans are finding the Net. Here's how your company can boost revenue by gaining mind share within this growing market

By Barb Cole-Gomolski



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JOE AUER/DRIVING THE DEAL

Should good suppliers worry about remedies?

GETTING A SUPPLIER to commit to service levels doesn't come automatically, but it's sure worth pushing for. Service-level agreements are essential if you want to get what you need out of any outsourcing or services deal. And if you want your agreements to have teeth, you need to be able to measure the supplier's compliance and have remedies in place should the supplier fail to meet service levels. But can you actually get vendors to agree to this? It's not easy, but it's not impossible: In some recent deals for desktop management

services, several large health care, insurance and consumer products companies were able to get large integrators to agree to service levels and remedies — after much negotiation.

These days, more suppliers are stepping up to meaningful service-level commitments, but the customer has to establish significant negotiating power to gain those concessions. How? I find the best question to ask a supplier during remedy negotiations is this: "How much confidence do you have in your ability to perform?"

Of course suppliers assertively respond, "Oh! We have 100% confidence in our

ability to perform. It's no problem!" When you hear this, respond immediately with "Great! Then why are you worried about those remedies that would occur only if you don't perform? The more you worry about the remedies, the more you're scaring me to death!"

If the supplier still balks at remedies after you've led him down this logical path, maybe you should ask yourself if you've selected the right supplier. Only, do it out loud in earshot of suppliers. It tends to have a powerful effect on them. Sometimes you can even see them sweat and squirm.

Increasing the Procurement Functions

How is the IT procurement function viewed inside your company? Chances are, it's considered a necessary evil, at least from a budget or process standpoint. That's unfortunate: Not only can the procurement staff save a company millions, but it can also improve productivity by giving employees better tools to work with. Additionally, competent IT procurement can win performance assurances, customer rights and remedies and flexibility from suppliers.

But like anyone else, your procurement team needs to be

motivated and supported. They must be given the authority to conduct negotiations with suppliers, just like military leaders need the authority to conduct wars like warriors.

It's demotivating — and counterproductive — to treat the IT procurement function as just overhead.

Like anyone else, accountability and visibility get results. If your IT procurement staffers know they may become famous — or infamous — depending on the deals they make, they have more incentive to perform well. If they're aware their performance will be judged based on savings, reduced risk and how well the deal works, their incentive to make the best possible deal increases.

But if you're a procurement professional, there's no reason you have to wait to be appreciated. You can enhance the function's image and support in several ways. For example, produce a periodic summary of deal results for executive management. Include finan-

cial savings as well as areas where risk was significantly reduced. Here's another idea: Revisit deals after they've begun and assess the vendor's performance. For that report, consider including project deliverables or milestones, the supplier's successes or failures to date and the remedies em-

bedded in the deal in case those failures occurred.

And here's something else: Start talking with other managers about how to combine their knowledge and your procurement expertise to do a better deal.

They are the stakeholders whose input you need, so get them on the team early.

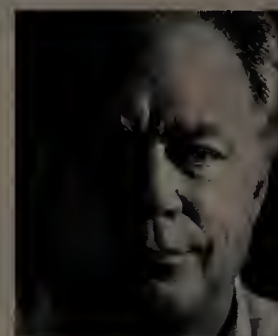
Those are only a few examples.

The main point here is that there are significant

benefits to be had

by simply increasing the visibility and accountability of your IT procurement staff. It's the way to prod them to make the best possible deal, on each and every deal. I'm sure your support would help, too.

It may sound like common sense — but it needs to be common practice as well. ▀



JOE AUER is president of International Computer Negotiations Inc. (www.dobetterdeals.com), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

WORKSTYLES

What It's Like to Work at . . . Playboy Entertainment

Interviewee: Rich Cupertino, manager of technology services. Company: Playboy Entertainment, a division of Playboy Enterprises Inc. (www.playboy.com and cyber.playboy.com).

Main location: Beverly Hills, Calif. Number of IT employees: Six in Beverly Hills; 40 to 45 throughout Playboy Enterprises.

How many are women? None. "Every time I've started to make a woman an offer, she's taken a job somewhere else."

Number of employees (end users): Three hundred in six different West Coast locations; almost 1,000

throughout Playboy Enterprises. Dress code: Business casual — Dockers and a nice shirt.

No silk pajamas? "Only for Playboy-themed events, like parties at the Playboy Mansion or in nightclubs. People will spend a lot of money on the pajamas, and perhaps a matching smoking jacket." Workday: 9 a.m. to 6 p.m. (but for IT staff, it's probably a 10-hour day).

Security badge/card needed to get into building or office? "Yes, absolutely."

Why absolutely? "Being Playboy, we have to be particularly careful in that area, based on the enthusiastic fan that is trying to hunt down his idolized Playmate."

"Sometimes the enthusiasm in the fan mail raises concerns."

Your decor? "We have a very, very artistic office. We have all original

Playboy artwork on the walls — artwork by Varga, Leroy Nieman, people like that.

"We have a very intricate and fancy staircase between the second and third floors that people refer to as the 'Million Dollar Stairway.' It was modeled after the spine of a former Playmate. I don't know if it actually cost \$1 million."

No photographs of Playmates on the walls? "We have headshots of the Playmates in our promotions department, which is responsible for finding them other work after they've been selected as Playmates."

Must people carry beepers? Yes. Percentage of staff that telecommutes on a given day: "I'm the only person who does that occasionally, just so I can work uninterrupted." Do you have on-site day care? No. An in-house cafeteria/food service? "We have a service that comes in every day at 10:30 a.m. with food (things like burritos, lasagna, salads) for employee purchase. You can put your choice in the

employee refrigerator."

Its rating? "It's pretty good. I keep a microwave under my desk so I don't have to stand in line in the employee lounge to use that microwave."

Did Playboy buy you the microwave? "No, but they have purchased mini-refrigerators for some of the offices, and each month employees put in an order for the beverages they want. You can order bottled water, juices, soda."

Little perks? "If we're trying to come up with a fresh title for our next video, whoever submits the winning suggestion might get dinner for two plus a movie."

"When we're having a charitable event in a nightclub, the employees are invited, and you see a lot of celebrities. And you see a lot at the Mansion parties."

Celebrity sightings? Ben Affleck, Shannen Doherty, Robert Stack, Red Buttons.

Any other companywide or department perk? The Christmas party at the Mansion.

Have you ever met Hugh Hefner?

"Oh, yes. I've been in his company many times because I am responsible for supporting Playboy Mansion."

Would employees feel comfortable e-mailing him? "No. That's just clearly not done. There's a certain amount of respect that people have toward issuing an e-mail to the founder."

What's the biggest misconception about working at Playboy?

"A lot of vendors who come to my door, when they're sitting in my guest chairs, they say, 'Wow, this looks like a regular business here.'"

And I always say, "Well, did you really expect that it would just be one big orgy behind corporate doors?" And they say, "Yeah."

Quote: "We have a very casual way of conducting day-to-day business. This is still a very young company with great potential, and I would not have sacrificed this experience of working here for anything in the world."

— Leslie Goff

TECHNOLOGY

ASP GOES CROSS-PLATFORM

Boeing likes Microsoft's Active Server Pages because they're easier to develop and less draining on the server than CGI code. But the company wanted to run ASPs on non-Microsoft platforms. The answer: ChiliSoft's ChiliAsp. **▶ 64**

PENTIUM SERIAL NUMBER EXPLOIT

A Montreal company has posted an exploit that lifts Pentium III serial numbers without the user's knowledge. Intel, which said it had secured the numbers after a privacy brouhaha, shrugged. **▶ 69**

WINDOWS 2000

Corporate beta testers let us know how the new version of Microsoft's Office suite is shaping up. New e-mail and Web tools make it easier for users to do their jobs. **▶ 74**

MANAGED VPNS GO GLOBAL

MCI WorldCom, like AT&T, IBM and other global VPN vendors is wooing IT shops to outsource their worldwide private networks. MCI's standards-based security and local-language support may give it an edge. **▶ 68**

LISTENING IN?

A group claims the encryption algorithm used in the world's most

widely deployed cellular telephony system is vulnerable, in part because providers "zero out" 10 of 64 key bits. **▶ 67**

MORE RUSSIAN NEW YEAR

A recent Hack of the Month column generated so much e-mail, we had to respond. Yes, we mistakenly implied e-mail clients aren't vulnerable. And astute readers caught other technicalities. **▶ 68**

REVIEW: NEW WIRELESS PALM

The new Palm VII simplifies wireless setup, making it easier to provide secure wireless access to legacy databases via query apps developed with Palm's own tool kit. **▶ 66**

MELDING WIN CE, NT EMBEDDED

Corporate users, once confused by Microsoft's dual efforts in the embedded system arena, are figuring out how they'll work together: Windows CE for handhelds, NT Embedded for larger devices. **▶ 64**

FLASHBACK: 1969

Unix was born, and the first Arpanet (later, Internet) nodes were connected. Oh, and a man walked on the moon. **▶ 76**

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MANNA'S Ellen Rubin and Dan Ross: Taking personalization to the next level

REAL TIME: HERE 'FOR REAL'?

PLENTY OF WEB SITES ARE PERSONALIZED for a consumer's second visit. But what if there's no second visit because the shopper couldn't find what he wanted? Manna Network Technologies hopes to address this problem. Manna monitors visitors' actions and immediately alters your site's presentation. It's a glimpse of the e-commerce future — but make sure you're sitting down when you read the price.

70

ACTIVE SERVER PAGES FREED FROM PLATFORM

*Boeing didn't want to be restricted to
Microsoft's Internet Information Server*

BY DAVID ORENSTEIN

ONE development group at The Boeing Co. likes Active Server Pages (ASP) enough that it found a way to run them on non-Microsoft Web servers — even though few Microsoft products run on anything other than Windows.

Boeing's Advanced Information Engineering Group in Lakewood, Calif., is using Bellevue, Wash.-based ChiliSoft Inc.'s ChiliASP software to enable non-Microsoft Web servers, such as Netscape Communications Corp.'s SuiteSpot, to run ASP. They normally run only under Microsoft's Internet Information Server

(IIS) 3.0 on Windows NT.

Although Boeing senior project engineer Bill Crawford wants to run ASPs, he often doesn't want to run them on IIS because of security concerns and because NT isn't in use in all parts of Boeing.

ASPs, which are Web pages that can run embedded scripts on a server, appeal to the Boeing group because they can be developed using Visual Basic script, in which the group has the most expertise. The development projects must often be done as quickly as possible, Crawford said.

Using a fourth-generation language like Visual Basic lets developers work faster than with lower-level languages like

Java or C. Third-party components are also widely available for ASPs, which means that the company can buy logic rather than build it.

For a Windows NT-based application that tracks and reports flight data about the B-1 bomber for about 50 users, Boeing preferred to rely on the security of Netscape's SuiteSpot rather than IIS. By using ChiliASP to run ASPs on SuiteSpot, Crawford and his colleagues are developing another document and workflow management application for about 300 users that runs on Netscape's Web server on Solaris. The department using the application already had Solaris systems, which it didn't want to change just to run ASPs.

Before ASPs became available in late 1996, developers often had to write C programs that used Common Gateway

Interface (CGI) on Web servers. Because CGI starts a new process on the server for every client request, it can quickly become an unmanageable drain on resources.

"The faults of CGI are very well-documented. Nobody likes it," said analyst John Rymer at Upstream Consulting Inc. in Emeryville, Calif. ASP and a competing standard, Java Server Pages, manage processes better already, he said.

Office Depot.com, the San Francisco online division of the office supplies giant, developed ASPs two years ago because, at the time, the Visual Basic skills needed to develop them were more common than Java skills, said technology director Francis Juliano.

As Office Depot.com continues to grow, it may need to migrate to a more scalable platform than IIS on NT, Juliano

Alphabet Soup

Active Server Page (ASP): A Web page capable of running embedded scripts written with Visual Basic or Java. ChiliSoft's ChiliASP allows ASPs to run in server environments other than Microsoft Internet Information Server on Windows NT.

Common Gateway Interface (CGI): Allows scripts and programs, often written in Perl and C, to link an HTML page to a database or other program.

Java Server Page (JSP): Based on Java rather than Windows and Visual Basic, JSPs also run embedded scripts from within a Web page.

SOURCE: THE COMPUTER GLOSSARY BY ALAN FREEDMAN AND SUN MICROSYSTEMS INC.

said. It could use server-side Java technologies like servlets or use ChiliASP to run its ASPs on another operating system such as Solaris, Juliano said.

Customers Sort Out Roles for Windows CE, NT Embedded

*Windows CE aimed at small handhelds,
NT Embedded at larger office products*

BY SHARON GAUDIN

Corporate users, who Microsoft Corp. acknowledges have been confused by its dual efforts in the embedded operating system arena, are figuring out how those operating systems will work together to connect users with a wider range of machines and keep

them linked up when they're away from the office.

Microsoft is trying to blanket the lightweight embedded market with Windows CE, which was designed for smart phones, handhelds, smart pagers and television set-top boxes. It can run on between 4M and 8M bytes of RAM.

Windows NT Embedded, which is still in beta testing, is aimed at larger devices such as fax machines, copiers, automated manufacturing machines and medical monitors that will be linked to corporate systems.

Embedded NT will run on 12M bytes of RAM and is expected to ship to manufacturers before year's end, according to Vince Mendillo, Microsoft's lead product manager for Windows NT Embedded and appliance strategy. The manufacturers will bundle Embedded NT into products that will reach the market next year.

"Once you weed through what these things do, it's pretty interesting stuff," said Paul Soares, general manager and senior vice president of finance at Alden Buick Pontiac GMC in Fairhaven, Mass. "It looks like we'll be able to do a lot more work with what have always been dumb devices."

"With NT Embedded, my machines could talk back and forth," Soares said. "I could even talk with my postage ma-

chine or my inventory scanner. I could download information on what we spent on postage that day and which department spent what percentage of the money. At the end of the month, you could download the activity and allocate the expense by department."

Isaac Applbaum, president and CEO of Concorde Solutions Inc., the Concord, Calif.-based IT division of Bank of America, said he's looking forward to Microsoft adding NT Embedded to the already-shipping Windows CE.

"I just see the flow of our information being so much greater," he said. "NT is going to [increase the usefulness] of a lot of my dumb machines in the office, and I see CE helping me personally. I'll be able to stay connected to my e-mail, my faxes and online sites through a wireless phone."

Bill Peterson, an analyst at International Data Corp. in Framingham, Mass., said Windows CE will gain in importance as IT departments begin to issue handheld de-

vices, smart phones and pagers, much as they do laptops today.

"A lot of organizations don't have a [personal digital assistant] policy, but will that still be the case in a couple of years? No, it won't," Peterson said. "Organizations will have to have the policy because salespeople and other business travelers will want to have their tools — e-mail and calendaring — accessible no matter where they are."

SNAPSHOT

Worldwide Database Market



* Projected

SOURCE: DATAQUEST, STAMFORD, CONN.

Comparing NT Embedded With Windows CE

NT EMBEDDED

Memory: 12M bytes of RAM

Operating system: Based on Windows NT 4.0 with Service Pack 4

Runs on: Fax machines, copiers, automated manufacturing machines and medical monitoring machines

Availability: In beta now and expected to ship by year's end

WINDOWS CE

Memory: 4M to 8M bytes of RAM

Operating system: Based on its own design

Runs on: Smart phones, handheld PCs, smart pagers and set-top boxes;

Availability: Now

Special Advertising Supplement

SecureWay Software

e-business



The Critical Foundation for e-business

SecureWay Software: The Critical Foundation for e-business

The difference between a controlled and an uncontrolled reaction doesn't depend on the participants as much as the environment where it takes place. Fuel, oxygen and a spark, in a carefully engineered, controlled casing, enable a rocket to travel to other planets at speeds in excess of 25,000 miles per hour. Yet these same ingredients, combined in a vulner-

able shell plagued by structural weaknesses, can become a deadly bomb.

These laws apply to e-business as well as chemistry. In a controlled environment, where Internet technology serves as the catalyst reacting with business processes and users, e-business can prosper, supplementing or replacing traditional operations. In a not-so-controlled setting (such as one lacking scalability, flexibility or security), the results are unpredictable. Reactions that appear positive at first can quickly degenerate into a series of negative events that can adversely affect and, in the worst case, even destroy a business.

Scott Kandel, a partner in the e-business and Internet technology practice at Deloitte & Touche, says that many firms establishing e-business initiatives overemphasize time-to-market at the

expense of designing a flexible and secure foundation. His team performs attack penetration (white-hat hacking) to uncover security weaknesses. "We were able to get into one place's online systems externally and access all the credit card data they had collected," he says. "Such situations are much more common than you'd expect."

Clearly, without the right mechanisms in place—security as well as reliable connectivity and centralized resource control—an e-business remains quite vulnerable. Yet such safeguards cannot impede function. Within a controlled environment, e-business applications need the ability to:

- **Locate** people, information and other applications in the network
- **Connect** customers, partners and employees to resources located across multiple systems, and
- **Secure** communication of data and transactions.

By integrating directory, connectivity and security, IBM SecureWay Software, the first family of software to bring together these fundamental capabilities, reduces cost, com-



locate...

plexity and risk. Within the context of the IBM application framework for e-business, SecureWay Software brings control to the e-business environment so companies can reap the rewards of a globally connected economy.

Locate and connect across multiple types of computer systems

The demands of e-business create a hierarchy of requirements where, as each new capability comes into play, the need for the next one becomes apparent. Starting with the basics, an e-business must be able to connect and communicate with customers, suppliers, partners across the Internet and employees across an intranet using a variety of computing systems. And these parties must be able to locate the resources they need. The solutions must also be operating system-independent. Any setup that doesn't conquer these basic challenges can't be considered an e-business.

Leverage current data and applications via the Web

Since Internet technology offers the most cost-effective way to connect different platforms, the next logical requirement is to enable access to existing applications from the Web so that any authorized Web browser user can leverage company data and services from anywhere. As this happens, a business opens up its assets to a wide audience. It adds a certain amount of risk to its operations, just as adding fuel to a rocket intensifies its explosiveness.

Decrease risks associated with Internet-based operations

Consequently, a greater need to protect data and applications arises, which of course implies security. In 1998, when International Data Corp. (IDC) surveyed

Reduce complexity and costs

One of the things that makes running a network so complex is the need to know how to find all the different resources located on that network. Resource information resides in different directories throughout the network. If an e-business is going to make progress and grow, there needs to be a way to update and synchronize information—no matter where it's located.

Deliver new Web services quickly and profitably

Once a rocket takes off, it continually uses more fuel. Similarly, once a company begins to offer services using Internet technology, it needs to continue to exploit that power. To stay competitive, an e-business must consistently deliver new applications that either react to or leapfrog the market.

"We have heard from our providers and

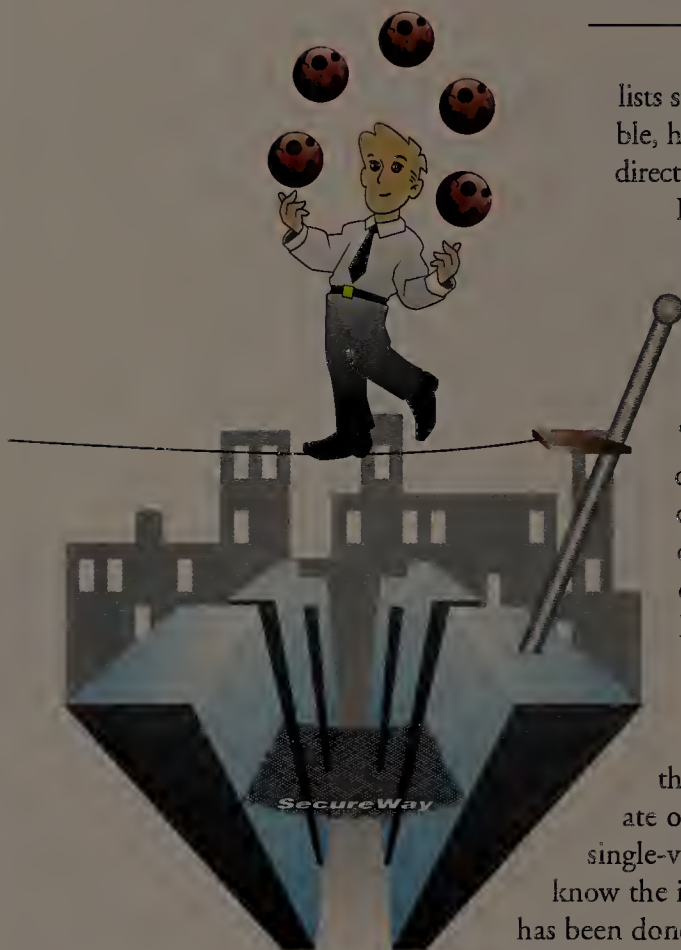
connect... secure...

IT executives on Internet security, nearly half the respondents said they believed the number of security threats to their organizations would increase by approximately 20% each year.

Without the right security controls in place, a company could suffer some very embarrassing consequences. Group Health, Inc., the largest not-for-profit health services corporation operating in New York State, has a Web site where, among other services, customers can check the status of their claims. Art Louise, Assistant Vice President of MIS at Group Health, says, "We insure many of New York City's finest: the police, firemen and people in some very critical positions. The last thing we need is to have a high-profile New Yorker's medical records show up on somebody's Web site." Given the importance of security to e-business success, cost and complexity cannot remain barriers to its implementation.

hospitals that they are very happy with the service on our Web site," says Mr. Louise of Group Health. "But if we don't keep moving ahead, we can potentially lose them to another insurer that's more technologically advanced." An e-business needs to ensure that any customer, employee, supplier or partner—located anywhere on the network—can access new services and up-to-the-minute information.

The result of defining a system where each necessary capability builds upon the prior one is a set of interconnected requirements. When any of those requirements aren't met, the overall structure becomes unwieldy and unstable. Mr. Kandel of Deloitte & Touche goes a step further. "Today, you cannot have a complete e-business infrastructure without a highly integrated, interoperable security and directory solution," he explained. "For authentication and encryption with digital certificates, you need both the certificates and the revocation



lists stored in an accessible, high-performance directory service."

Furthermore, Mr. Kandel thinks it is cleaner to use a single vendor to create an integrated infrastructure.

"Theoretically, with open standards you can mix and match components from different vendors," he says. "But the reality is—and we've seen this in our testing—that they don't interoperate off the shelf. With a single-vendor solution, you

know the integration work has been done. Plus some important function points, such as directory replication, that aren't included in the standards will still be there."

If security is there, but complicated and expensive to implement, it affects the speed with which a company can offer new online services. Actually, the complexity and expense have caused many companies to shy away from linking to the Internet or even an intranet.

Jim Fessler, CEO of Computer PS, a software reseller specializing in high-availability security solutions, has seen companies drop e-business projects completely. "Customers were thinking about putting a part of their business on the Web," he says. "But their worries about security and its associated costs made them stop. That happens a lot."

Even if companies are prepared for the costs and the complexity, then the fight becomes one against time. They may implement new applications but it takes too long to roll them out. By the time the application is available enterprise-wide, the competition has gone on to something else—possibly leaving a business in perpetual catch-up mode.



SecureWay Software: a simpler, more secure foundation for e-business

Given the dependent nature of e-business requirements, the simplest solutions must integrate the key elements that fulfill those needs. In other words, interrelated requirements call for integrated solutions. Satisfying each requirement independent of the others becomes a formula for creating unnecessary complexity.

Many development houses have produced very good solutions to individual security problems. As a result, a company may use one vendor's software to control access to sensitive information and another's to ensure user identity. For each policy change that affects both solutions, an explicit action needs to be taken on each product. Inadvertently skipping one compromises the integrity of the overall system.

Complexity isn't the only problem that arises when companies look for independent solutions; instability also becomes a threat. "When I think about what I need to satisfy the requirements of e-business, I visualize building blocks," says Doug Ring, director of emerging technologies for GEAC Smart Enterprise Solutions. "So if I pull out just the corners of those stacks, the whole thing comes tumbling down." Mr. Ring is implying that the failure of any one package can compromise the entire e-business support structure. Through several points of integration—some available in the short term and others a little further out—SecureWay Software simplifies the e-business environment to lower costs and reduce risk.

The importance of standards

Offering an integrated set of products to support a flexible e-business environment would be impossible if SecureWay Software were not based upon open, cross-platform standards for directory, connectivity and security. The certificate-based standards for security accommodate e-business growth. They also benefit companies immediately by simplifying access to multiple applications. Once a user enters her certificate, she can freely move among standards-compliant applications.

Centralized scalable enterprise directory

Today, almost every networked application has a proprietary directory for storing information about its authorized users. A Forrester Research report indicates that, on average, Fortune 500 enterprises have nearly 200 separate directories with the same information appearing in many of them. Therefore, integrating directories goes a long way towards simplifying a network.

Without a single, central repository, administrators need to keep all directories synchronized. If a user changes her name when she gets married, the administrator needs to update the directories for each application she uses. An integrated directory scheme eliminates this administrative quagmire, and consequently reduces network operating costs.

Policy integration

Another high leverage point of integration is policy. Through a common administrative console and repository for policy information, SecureWay Software will offer both security and network policy integration. With these integrated functions, an organization can define an enterprise-wide policy on how applications and users should behave. These rules, stored in a common directory, are available to all "policy consumers," namely SecureWay Software products and other compliant applications.

For example, with SecureWay Software's common means of describing who has access to what, a business can enable consistent and secure business practices throughout the enterprise. Consistency, combined with the intrusion detection offered in SecureWay FirstSecure, makes it easier to detect potential threats by identifying users repeatedly trying to gain access to unauthorized resources. In addition, SecureWay Software will integrate virtual private network (VPN) policy, to further protect an organization's integrity by defining secure tunnels through the unsecured Internet.

Longer term, the network policies in SecureWay Software will specify the service level agreements for the network or the quality of service (QoS) that a particular application



user can expect. A common way of defining, storing and accessing network policy can improve factors such as customer satisfaction by handling network traffic according to business priorities.

In general, when policies can be established and managed with relative ease, it's more likely that the entire enterprise will adhere to them. By enabling this greater ease, SecureWay Software will create a more secure and well-run e-business environment. Furthermore, the effect of integrating both policy and directory allows SecureWay Software to offer the additional development and deployment benefits that are gained when e-business applications can exploit common security and user structures.

Host integration

One of the fastest ways to start benefiting from Internet technology is to integrate host systems with an intranet, extranet or the Internet. SecureWay Software's host integration products protect and extend a company's investments in existing applications by enabling Web browser access to host applications. SecureWay Host Publisher and Host On-Demand can jump-start e-business because they require no changes to original host applications. SecureWay Software moves existing applications to the Web at a justifiable cost and in an aggressive time frame.



Simple secure access

Single sign-on technology simplifies access for users. Users can access any secure resource in the network by entering their credentials (usually, just user ID and password) only once. Besides the productivity gain, implementing single sign-on technology can directly impact costs too. A Forrester Research study found that 80% of help desk calls are password-related and that single sign-on can reduce help-desk calls by 40%. Therefore, a company with 20,000 users can potentially realize a savings of nearly \$4.4 million.

Maintaining personal preference information on the network

Integration of SecureWay On Demand Server, which is planned for subsequent SecureWay Software releases, will standardize how network resources are accessed and stored on the server so that they can be retrieved by whoever needs them "on demand." These resources include information that has been stored on client systems, such as preference information. Combining the centralized control that comes with traditional mainframe computing with the more natural interface and independence of PCs can yield a number of substantial benefits.

Adding a personal preference capability—where the network maintains a profile of each user, based on user ID as opposed to network address—can strengthen policy-based computing. Applying this preference layer so that the network can identify individuals adds another dimension to IT's ability to implement business practices. For example, during forecast periods, salespeople using a forecasting tool would have higher priority than other traffic.



By limiting deployment of new applications or updates to servers rather than to all the connected clients, a company can significantly compress rollout schedules. A company with this kind of setup is always prepared to make quick responses to market changes, which makes it a formidable competitor.

Server-based computing frees users from being tied to a specific client because they can reach information and applications from anywhere in the network. Furthermore, software that translates user interface code into formats suitable for any user device strengthens this centralized model. People can choose device types other than PCs and laptops to access and interact with applications residing on a server. For example, a mobile workforce using handheld devices can have immediate access to the resources on the network.

The whole is greater than the sum of its parts

SecureWay Software enriches an e-business by creating an environment where directory, connectivity and security work in concert. Most individual SecureWay Software func-

Imagine the Future with IBM SecureWay Software

SecureWay Software's integration of the core e-business technologies—for locate, connect and secure—simplifies the network environment such that whole new ways of doing business become not only possible but feasible.

Keep mobile workforce online.

With the same access to transactions and services they have in the office.

With SecureWay Software, a salesman visiting a customer's office can check stock levels directly from the inventory system as easily as he runs his e-mail. The same sign-on

procedure he uses to get e-mail will give him the necessary authorization and authentication to tap into valuable IT assets, yet keep them secure from intruders.

...and in line

with restricted access to highly confidential data. Certain sensitive transactions are best not done from the road. SecureWay Software lets you restrict accessibility depending on location. So although it makes sense for a human resources executive to access some aspects of the benefits system, it is not appropriate to

make salary adjustments from an off-site location.

Shift administrative burden to suppliers...

through electronic ordering to cut down paperwork, reduce inventories and avoid out-of-stock situations. Through an e-business built with SecureWay Software, your suppliers can monitor stock levels and usage, update systems with delivery information and link directly to the accounts payable system. Yet you can be confident these suppliers can access and update only the authorized systems.

tions are available from other vendors, but these vendors tend to focus on one or two requirements. IBM is the first to offer an overarching strategy that reduces complexity, cost and risk, so that an e-business can enjoy explosive growth with confidence.

Integration in action

Delivering a host application to employees on an intranet or launching an e-commerce Web site is like sending a rocket to the moon. It's not just a matter of getting the rocket on the launch pad; all the support elements need to be in place before igniting the engines. And it all happens much smoother and quicker with a centralized control point.

In the case where a host application is moved to an intranet, other host applications and data sets are more exposed. Hence it's important to get access control in place. With access control comes the need to verify the user through certification standards. Also, information about the users must be stored in a directory. SecureWay Software includes all the necessary pieces: host integration, access control, authentication and the directory.

Without a solution like SecureWay Soft-

ware that integrates all the required elements, moving a host application would entail creating a unique directory for each: the application, the access control program and the authentication program. And if another new application were added, a complete new set of directories would need to be built to support it. By virtue of its integration, one SecureWay directory is all that is needed to properly secure and connect this host application to authorized users on an intranet.



Stabilizing e-business environments

SecureWay Software not only reduces the cost and complexity of building and running an e-business, it protects it from the elements that destabilize an application's ability to locate, connect and secure. For example, SecureWay Software can help avoid situations where a Web user can't reach a back-end database, locate a network printer or remember a password. As a result, it creates a controlled and trusted e-business environment where the only unexpected reactions come from exceeding profit expectations. SecureWay Software is the critical foundation for faster success.

Innovative customer interactions

When your customers can connect to networks that are rock-solid secure, they feel comfortable supplying personal information and conducting financial transactions online. A trusted e-business environment, combined with an integrated directory structure and innovative programming, means you can offer services that keep your customers loyal and create processes that lower costs.

Utilities

Share the wealth. Encourage customers to receive and pay their bills on the Internet by giving the Web customers discounted rates. Offer

online information about energy consumption that helps customers budget their monthly energy costs.

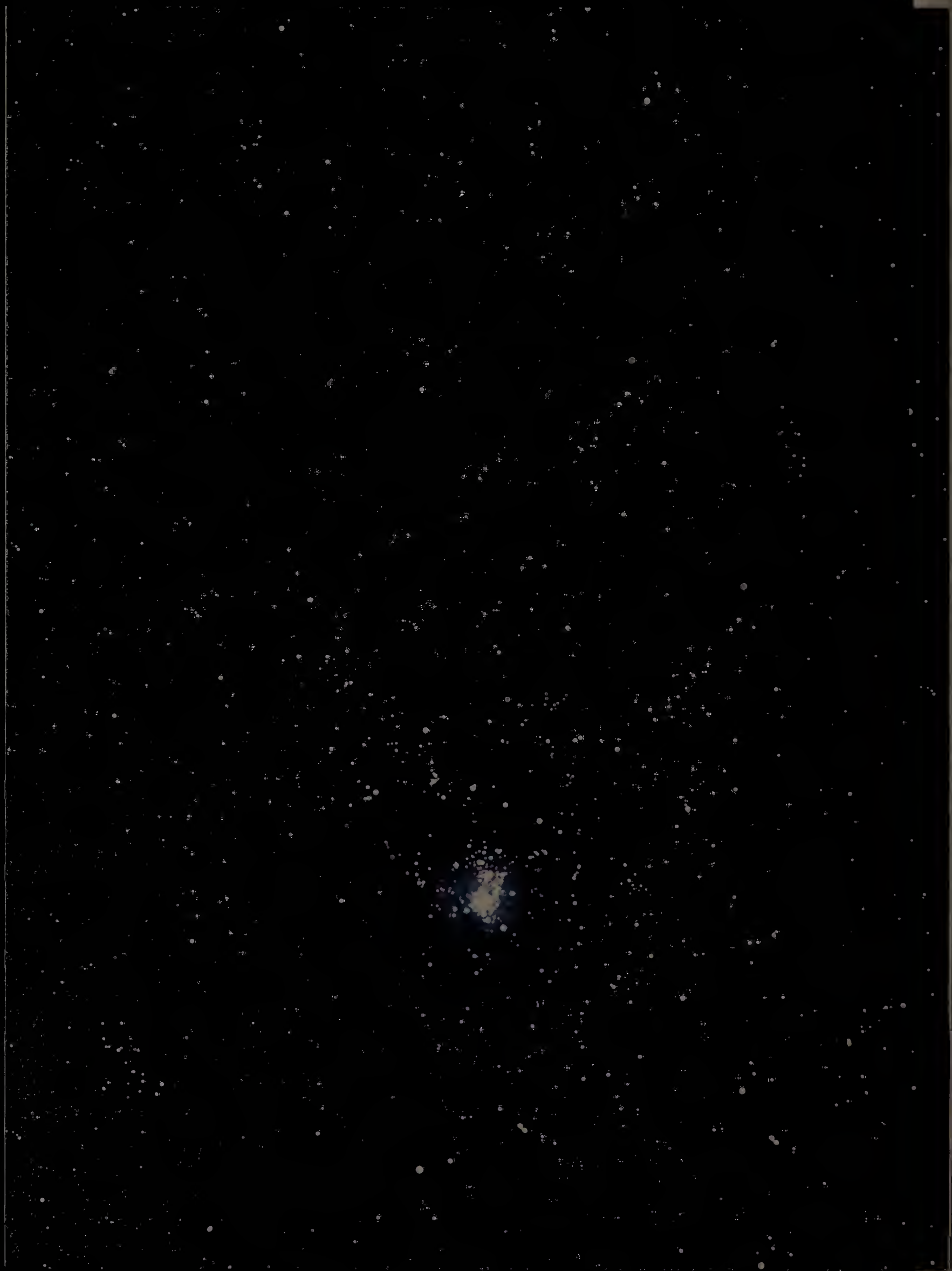
Healthcare insurance

Participate in disease management. With his knowledge and agreement, you can monitor the medication consumption of a customer with a chronic condition to make sure his usage pattern benefits his condition. If through his claims it appears he's not taking his medicine at the right rate, you can notify him.

Beyond the Web... empowering travelers

With the strategic placement of kiosks, along with smart cards and

SecureWay technology, traveling can become a lot easier. By encrypting airline tickets in a smart card, a traveler can go directly to a kiosk at the gate for his boarding pass. At a hotel, a kiosk outfitted with the right hardware can access customer preferences from the smart card and then encode the magnetic stripe on the smart card so it becomes the room key. If someone loses their smart card, it's not a big deal to replace because the information can be loaded on a new card from his PC. And the missing card isn't a threat since anyone who finds it won't have the pin number.



Spotfire Offers Low-Cost Mining Tool

BY STEWART DECK

Medical research isn't often turned to for its economic wisdom, but now a data visualization tool aimed primarily at life-science and pharmaceutical researchers may well point the way toward a form of low-cost data mining for business users.

Spotfire 4, just-released by Cambridge, Mass.-based Spotfire Inc., was designed to provide those low-cost capabilities. It gives users the ability to visualize, analyze and mine large sets of technical and multidimensional data.

Company officials acknowledged that Spotfire doesn't carry the heft or the analytic capabilities of traditional mining tools from the likes of SAS Institute Inc. or Thinking Machines Corp., but its price tag, starting at \$5,000 per seat, has attracted many users.

Finding Patterns

"It has solved a lot of headaches at once for us," said Curtis Lockshin, a researcher in the drug discovery division at Sepracor Inc., a Marlboro, Mass.-based pharmaceutical company.

Without Spotfire, Lockshin said, he would have to query

for a single answer at a time, then compare results in a spreadsheet graph. That probably wouldn't highlight the

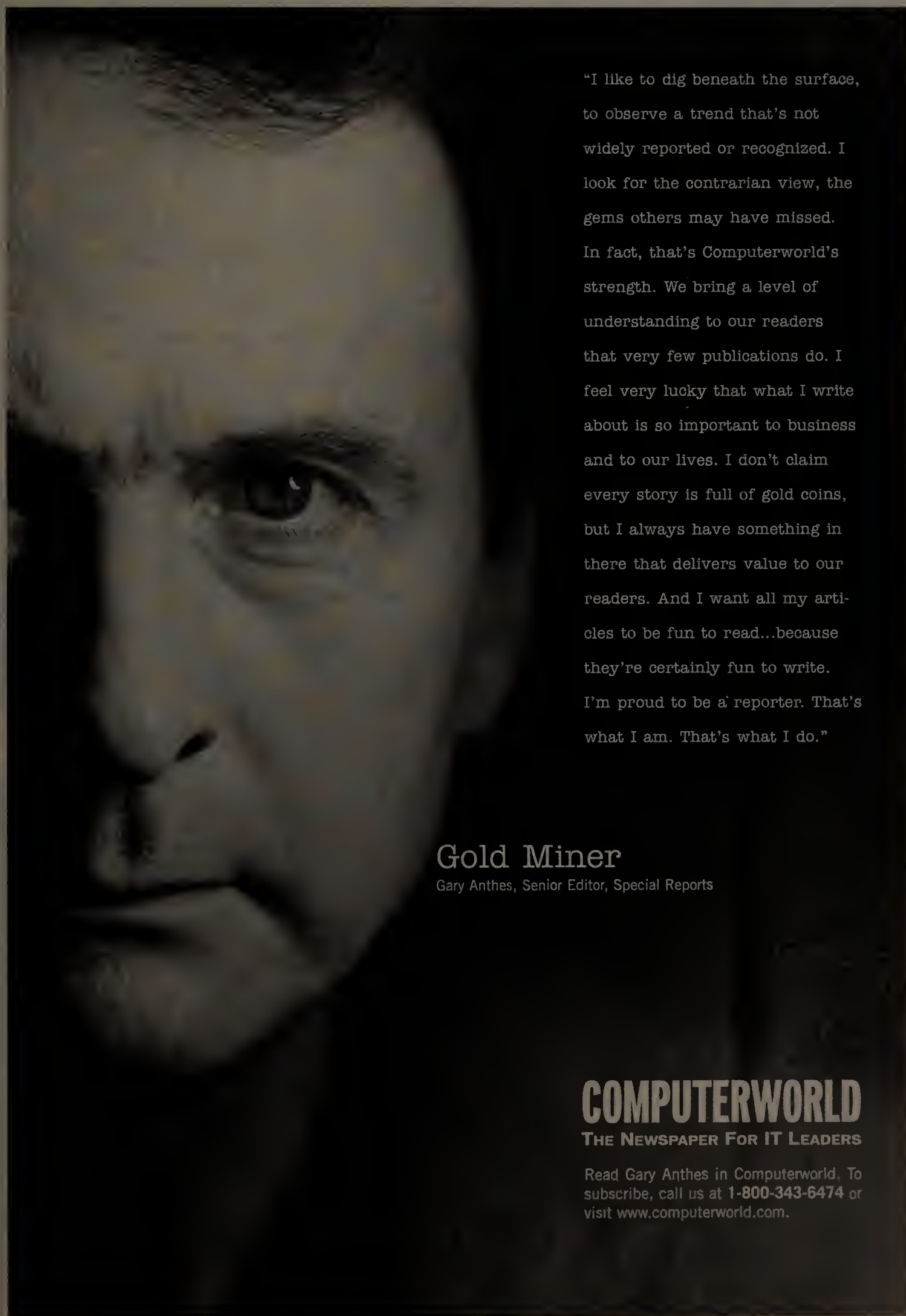
patterns and connections that turn up with data visualization tools.

Although focused on the re-

search market now, Spotfire plans to target a larger business audience with forthcoming releases. But one analyst said such a move might not be a simple one.

"They've done the smart thing in customizing their vi-

sualizations for particular industries," said Herb Edelstein, an analyst at Two Crows Corp., a Potomac, Md.-based consultancy. "But this may make it difficult initially [for them] to translate that to the general business community." ▀



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Gold Miner
Gary Anthes, Senior Editor, Special Reports

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www.computerworld.com/more

BRIEFS

Blue Angel Web Tools

Blue Angel Technologies Inc. has announced MetaStar Enterprise, software for deploying information-based applications on the Web.

The software integrates database, search engine and Web technologies and uses Extensible Markup Language as its underlying data exchange format.

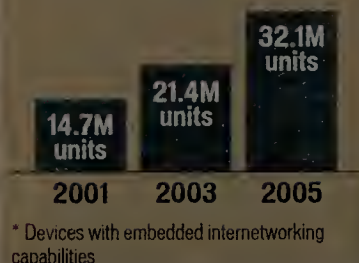
It lets users add, update and delete records in Microsoft Corp. SQL or Oracle Corp. databases from a Web browser. The changes are automatically indexed so that updated information is immediately available on the Web, according to the Valley Forge, Pa., company.

Prices range from \$35,000 to \$60,000.

www.blueangeltech.com

BRIEFS**Net Devices Soar**

Worldwide shipment forecast for Internet appliances*



SOURCE: COMPUTER ECONOMICS, CARLSBAD, CALIF.

Micron Rolls Out Xeon-based Servers

Micron Electronics Inc. has released NetFrame 5200 and NetFrame 5201, servers that support one or two 550-MHz Pentium III Xeon processors.

The servers offer up to 2G bytes of synchronous dynamic RAM and up to 108G bytes of internal storage, according to the Nampa, Idaho, company. The 5200 comes bundled with Windows NT Server 4.0. The 5201 can be configured with NetWare. Pricing starts at \$4,799. www.micronpc.com

Videoconferencing System Bows

Polycom Inc. has announced the ViewStation SP group videoconferencing system for small meeting rooms and offices.

The system supports video up to 15 frames per second at 128K bit/sec., according to the San Jose company. It costs \$3,999. www.polycom.com

Wedge Adds Notebook

Wedge Technology Inc. has announced the ShowBiz 9000P, a presentation notebook computer that can be equipped with either a 300- or 366-MHz Pentium II mobile processor.

The notebook features a video display that converts to a projection panel. When used as an overhead projector, the panel can display an image up to six feet away, according to the San Jose company.

Pricing starts at \$3,495. www.wedgetech.com

QUERIES WITHOUT WIRES: PALM VII HOLDS PROMISE

REVIEW: *The Palm VII simplifies wireless communications and makes it easier to provide secure access to legacy databases*

BY RUSSELL KAY

A FEW MONTHS ago, I reviewed 3Com Corp.'s then-new Palm IIIx and Palm V handheld personal digital assistants (PDA) [CW, March 8]. I gave them high marks as organizers but really disliked using them as communications tools.

Given that experience, I was highly skeptical about the likely usefulness of the announced but not-yet-shown Palm VII — essentially a Palm IIIx with built-in wireless communications for e-mail and Internet access. I didn't expect much, and I was dead wrong. It's a better tool than I had imagined, and one that may make IT managers sit up and take notice of supporting PDAs.

The VII is notable for how it simplifies wireless setup and for the fact that it's a complete system out of the box. It also eases simplified, secure wireless access to an organization's private databases via query applications developed with Palm Computing Inc.'s own tool kit.

Wireless Palm

Recognizing the narrowness of the 8K-bit/sec. wireless datapipe into the Palm VII, 3Com developed an approach to Internet access (their term is Web Clipping) that uses query applications resident in the unit. When you use one, you invoke a dialogue and make choices or queries appropriate to that application — say, to inquire about airline flights between two cities on a given date and time. The application extracts the essence of that query and sends it to a server, which in turn translates the query for the host application and sends it to the indicated Web address, together with any required encrypted authentication information. The server gets the answer back, extracts the data, and

compresses it for retransmission to your handheld unit.

That two-stage approach, relying on the handheld unit for defining the query and the server for Internet access and processing, reduces both the amount of data that the VII needs to transmit and receive and the amount of power it consumes while doing so. 3Com predicts that a pair of AAA batteries will last up to two weeks (and also recharge the non-replaceable internal NiCad power cell).

In developing the VII, 3Com managers learned firsthand how difficult it can be to set up wireless communications: You have to involve an Internet service provider, a third-party wireless modem and a phone call to set up the account, and then you have to

program (correctly) all the needed parameters into the machine.

But with the Palm VII, setup is quite simple, and the key is that Palm provides both the hardware and the communications channel. 3Com has established Palm.net, a central server farm that acts as the remote host for all Palm VII handhelds. The user just raises the antenna that tucks alongside the Palm VII's right side. This turns the radio on and checks for access to the BellSouth Wireless Data Network, which covers 260 U.S. cities. If it's a machine's first on-air session, a dialogue prompts for registration information and payment data. When that's done, it calls up Palm.net via an encrypted link, opens an account (service plans begin at \$10 per month), and in about 90 seconds you're in business.

The real potential of the Palm VII, how-

ever, may be the control it offers the IT manager. The Palm VII wireless platform allows users to access information over the Internet, and this can include secure access to your own corporate databases. It's a limited-bandwidth, application-controlled, encrypted access path, it offers a lot of security along with its convenience, and it seems to give individual users fewer opportunities to do something improper. I believe it will prove a surprisingly effective tool for many roving professionals.

The Palm VII comes with several prepackaged query applications, including automated-teller-machine-locators and a variety of news, financial, travel, entertainment, weather and map services. But its CD-ROM also includes software that lets you write your own query applications in HTML to access whatever Web resources you wish. Better yet, because all Palm communications are standards-based, your IT department can set up a server outside your firewall to receive queries from Palm.net, authenticate them, and provide secure, encrypted access to corporate data, such as an SAP R/3 inventory database, a customer list, order entry and status information and more.

As good as the Palm VII is, it has drawbacks that will be significant to some users. For example, it doesn't notify you that you have e-mail — you have to check manually. Also, although the Palm communications model is bandwidth-spar-

Continued, next page



THE PALM VII is a complete system out of the box

Cellular Phone Encryption Challenged

BY ANN HARRISON

Information technology managers may be leery of allowing sensitive business conversations over cellular phones after cryptographers last week charged that the encryption used for certain cell phones is vulnerable to eavesdropping.

Members of a California-based group of privacy activists called the Cyberpunks distributed the source code for a widely used cell-phone encryption algorithm in hope that others can evaluate its strength. The algorithm, called A5/1, is an over-the-air, voice-privacy algorithm used to secure the Global System for Mobile Communications (GSM).

GSM is the most widely deployed cellular telephony system in the world, with more than 100 million subscribers. The A5/1 algorithm — embedded in every GSM mobile phone and base station — requires a full 64-bit encryption key to secure phone calls.

But Marc Bricero, one of the researchers who released the code, said GSM providers don't tell their customers that they "zero out" 10 of the 64 key bits. "Most or all providers deliberately weakened the key strength by a factor of over 1,000," Bricero said.

Charles Brookson, chairman

of the GSM Association Security Group, a Dublin-based group of security experts from the world's GSM operators,

said the key space of A5/1 had been reduced from 64 to 56 bits to meet export restrictions.

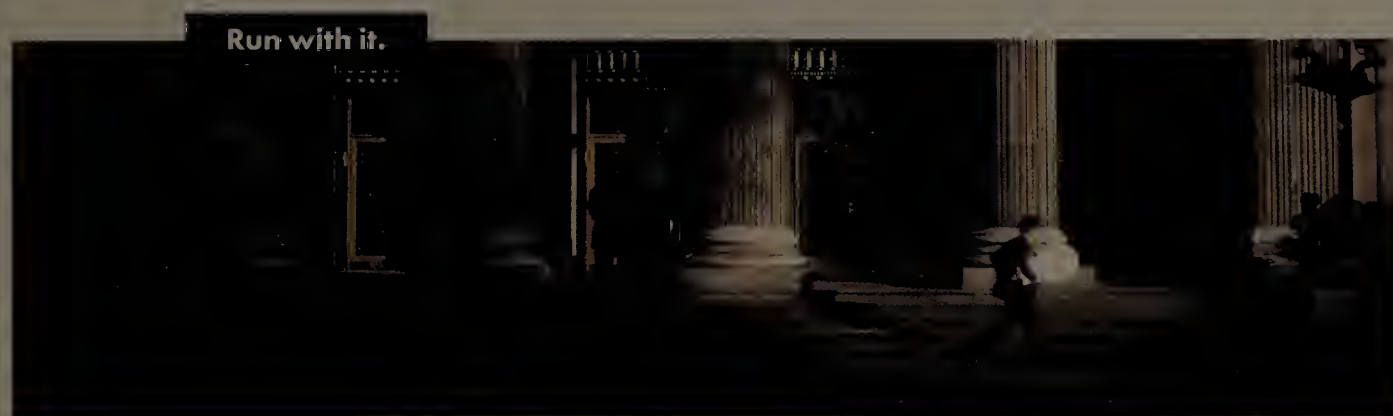
But Brookson denied that

the reduction left the algorithm vulnerable to attack.

"Can A5/1 be cracked? Absolutely," said analyst Craig Mathias at Farpoint Group, a research and consulting firm in Ashland, Mass.

However, Mathias said, an eavesdropper would also need to know the entire channel structure and follow the signal as it hops to different frequencies to intercept and decode a GSM signal. ▀

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www.computerworld.com/more

Palm VII Review

ing, allowing you to download only parts of messages to see if you want the whole thing, it doesn't do attachments. Moreover, though the Palm's Graffiti handwriting system is acceptable for inputting very short messages, it can be a real nuisance for longer messages.

Even a tiny keyboard, such as those found on Research In Motion Ltd.'s Blackberry or Nokia Corp.'s Communicator smart phone, would be a welcome improvement for sending e-mail. Despite these limitations, however, the Palm is a dandy package combining the extensive data storage of its organizer forebear with easy wireless communications. ▀

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MCI WORLDCOM OFFERS OUTSOURCED GLOBAL VPNs

New offering outsources everything from design to ongoing operations

BY BOB WALLACE

COMPANIES looking to build international virtual private networks (VPN) will find that outsourcing to MCI WorldCom Inc.'s managed global VPN service can off-load network design, construction, management and monitoring.

MCI's UUnet Technologies unit recently detailed UUsecure VPN, a service that handles system setup, support, security, performance and VPN management.

"By combining global reach with standards-based VPN security, UUnet is delivering a unique managed VPN service," said Erik Zines, VPN analyst at TeleChoice Inc., a Boston consultancy. "Others offer managed services that are not standards-based or locally supported."

UUsecure will be available in 14 countries by year's end and will compete in the nascent managed international VPN market with offerings from IBM, AT&T Corp., GTE Corp. and Equant, experts said.

However, the service lacks support for dial-up access and is hitting the market later than established offerings from those rivals, which have built sizable customer bases, Zines said. Beyond that, most managed international VPN ser-

vices offer similar features.

"A managed global VPN service is attractive because it takes a lot of manpower and money to manage international communications," said Ram Prabhu, corporate communications manager at filter maker Millipore Corp., which is based in Bedford, Mass., and has sites in more than 35 countries. "It's an attractive option that we're going to look at."

To address network setup, UUnet will provide, configure, ship and install an all-in-one device from Xedia Corp. that

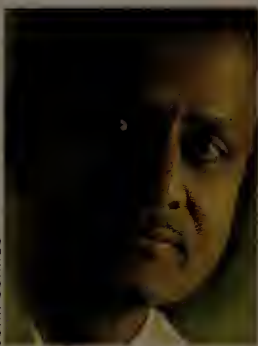
handles security and has firewall and bandwidth management features. UUnet also provides support in the language of whatever country it's in.

"A huge hurdle for prospective VPN users has been network setup; a bunch of companies have given up in this phase," Zines said. That's because it's resource-intensive and requires skilled information technology staffers in the U.S. and abroad, he added.

To allay user fears about performance, all traffic is carried on UUnet's Internet backbone, not the Net itself, and is constantly

monitored from a dedicated UUnet network operations center.

The Xedia devices help



RAM PRABHU at Millipore says the managed global VPN service is "an attractive option worth looking at"

Russian New Year Article Sparks E-Mail

We mistakenly implied that e-mail clients aren't vulnerable

BY DEBORAH RADCLIFF

Thanks to all of you for a most excellent technical education. My article "Russian New Year's Diabolical Twist" [CW, May 10] set off such response that I had to follow up.

The article explained how a once-harmless attack, Russian New Year, can now exploit the

CALL function of Microsoft Corp. Excel (which calls other Excel functions such as create, write and sum) and get onto a desktop without a user opening the e-mail attachment, which is how the attack is delivered.

You had several valid points, and one question that was tough to answer. I'll tackle the trickiest question first.

Henry Edward Hardy wrote that Netscape Navigator 4.5 and above isn't affected by this problem. Mike LaGuardia, Navigator product manager at Netscape Communications Corp., concurred.

But David Misakian, technical director at Finjan Software Ltd., an Israel-based maker of mobile code security software, said lab tests show that Navigator's Messenger client makes it vulnerable.

I sicced Netscape on Finjan and let them duke it out.

users avoid bandwidth bottlenecks by measuring usage on lines that access UUnet.

In stressing the tag team of the Xedia devices' security capabilities and the specialists in its network operations center, UUnet hopes to address this longtime user concern.

"Managed security is on the rise. Security specialists are in short demand and are increasingly tough for even large companies to hire and retain," said Greg Howard, a principal analyst at The HTRC Group, a San Jose consultancy. IT managers will find managed VPN security an attractive and less-expensive alternative, he said.

Analysts said the major reason to skip a managed VPN in favor of managed service is to retain control of the network. ▀

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For resources and articles on virtual private networks, visit our Web site. www.computerworld.com/more

JUST THE FACTS

UUsecure Service

Reach: 14 countries by year's end

Transport: UUnet's Internet backbone

Access: Provides all-in-one box

Security: IPSec encryption (56K or 168K bit) and tunneling

Support: In-country local language service and support

Monitoring: From dedicated UUnet VPN Network Operations Center

SLAs: For latency; available in the U.S. and abroad

Pricing for dedicated access in the U.S.: \$595 per month for 56K bit/sec. line; \$1,895 for 256K to 384K bit/sec. line; \$35,500 for a 45M bit/sec. line; installation services cost extra

Pricing for Europe and Asia-Pacific service: To be announced. Pricing includes equipment, Web-enabled reporting and nonstop end-to-end management and monitoring.

SOURCE: UUNET TECHNOLOGIES, FAIRFAX, VA.

er. And Web-based e-mail services like Hotmail, YahooMail and Excite Mail require a browser to access the service, said Finjan's Misakian. Once the message is opened, the browser or HTML-enabled Web client may launch the Excel file, executing the CALL command. . .

Many of you also pointed out the misleading subhead. Russian New Year is not a virus, but a method of attack. And the e-mail message must be opened to launch the attack. But neither the attachment nor the HTML link need be.

One more point: "Keith" said my dates were off. Russian was discovered earlier than January. In fact, Microsoft posted patches on its Web site on Dec. 10, 1998. Don't know how I missed that one. ▀

Radcliff is a freelance writer in San Francisco. Her Internet address is derad@aol.com

MOREONLINE

For more on Russian New Year, visit the following Web sites: www.microsoft.com/security/bulletins/ms98-018.asp; www.finjan.com/rn

SNAPSHOT

Satellite Communications Skyrocket

Revenue projections for worldwide global mobile personal communications via satellite:

YEAR REVENUE PROJECTION	
1999	\$2B
2000	\$3B
2001	\$5B
2002	\$7.5B
2003	\$13B
2004	\$20B

SOURCE: INSIGHT RESEARCH CORP. PARSIPPANY, N.J.

Intel Shrugs Off Privacy Service Firm's Pentium III Exploit

BY ANN HARRISON

Although the hack has been on the Web for months, Intel Corp. continues to shrug off an exploit said to show how malicious code can steal users' Pentium III serial numbers without their knowledge.

Zero Knowledge Systems in Montreal, which develops privacy tools that let users surf the Web anonymously, said it posted the exploit to demonstrate that Intel's scheme for protecting the serial number is flawed. Zero Knowledge System's program is on a Web site, which warns users that downloading the program will reboot their system.

Antitheft Goal

Intel embedded the serial number in Pentium III processors as a secure-commerce and machine-tracking device. In March, privacy activists filed a complaint with the Federal Trade Commission alleging that it could be used to track users on the Web.

Though activists demanded that Intel pull the chip from the market, Intel instead released a patch that it said disabled the serial number.

Zero Knowledge Systems developed a small ActiveX program that bypasses the software utility used in the patch. The ActiveX control, which can be hidden in a banner ad, simulates a computer crash when the user clicks on the ad. The program then loads a "Trojan horse" program that bypasses the utility. When the computer reboots, the ActiveX control grabs the serial number, places it in a cookie and shows the user how to find it on a Web site before erasing it.

Disabling Numbers

Zero Knowledge Systems said it has also discovered how to reactivate the serial number even if it has been disabled in the BIOS. Zero Knowledge Systems President Austin Hill said that at the time of the Pentium III controversy, Intel told manufacturers they could securely disable the number at the BIOS.

Intel spokesman George Alfs noted that antivirus software developed by McAfee Associates Inc. and Symantec Corp. protects users' serial numbers from being stolen with the

ActiveX control. He said Intel has spoken with Zero Knowledge Systems about the exploit and is working with BIOS ven-

dors and manufacturers to strengthen the BIOS. "We are looking for ways to tighten up or harden serial number pro-

tection," Alfs said. "There is a lot of malicious code out there, and we are always looking for ways to protect the PC plat-

form against attacks."

Hill notes that antivirus programs guard against his company's consensual exploit but are ineffective against crackers who use the same type of attack to steal serial numbers. ▀



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MANNA: REAL TIME BECOMES REALITY

FrontMind updates Web sites to suit surfers' tastes — on first visit

BY CYNTHIA MORGAN

A CUSTOMER asks a salesclerk for gum. "We're out," says the clerk, not looking up from his book. Candy? "Sorry." The customer walks out empty-handed, and the clerk shrugs: The next time that guy comes in, he'll want gum.

Fat lot of good that'll do if the customer doesn't come back.

That's the problem Newton, Mass.-based Manna Network Technologies Inc. wants to solve. Using tools from the world of artificial intelligence, its first product monitors site visitors' actions and immediately alters a Web site's presentations to match what it thinks a customer wants — before that customer leaves.

With most of today's Web personalization tools, the next visit, not the current one, results in a more personalized offering. Because it's all too easy for visitors to look elsewhere on the Web, the site that can't satisfy the customer on the first try has probably lost the chance.

Sure, today's personalized Web sites keep a watch on visitors' actions, segregate them into groups, then pour the appropriate content into dynamic Web pages. Amazon.com, for example, recommends new books based on the ones you're browsing.

But personalization tools are barely out of the custom development project category. They are generally based on Java, Microsoft Corp.'s Active Server and other dynamic Web technologies that need hard-to-come-by Web developer talent to update.

The programming foundation for those systems can be tough to build; the rules that keep them going swell to hundreds or thousands when the site's in active use, making scalability a problem. That also makes a system tough to alter quickly when inventory or cus-

tomer preference data dictates a change.

Worse, a new rule's debut is often on the live site. The slow reaction time of an unwieldy personalization system could annoy — and thus cost the business — hundreds of potential customers.

Manna's Java- and Extensible Markup Language-based FrontMind for Marketing, scheduled for a June 14 debut, puts a wizard-like Web front end on the rules creation and editing process that requires little training to use. It also "stages" the rule by simulating its effects before it goes live, so inexperienced users can see the results before unleashing a potential disaster on the live site.

Business managers can fine-tune online sales presentations or add special offerings quickly, without an intermediary from the information technology department. The feature may ultimately prove the most valuable for corporate e-commerce because giving managers control of their online product presentations speeds the site's reactions to changing market conditions. It also shifts that responsibility from resource-stretched IT managers to the people who sell the product.

FrontMind can develop demographic reports to help managers refine strategies. A manager whose inventory is overstocked can ask the system to profile the customer most

likely to buy that product, then use the profile to create a rule that presents a special sale price on that product only to the customers most likely to buy.

The system can offer buying hints to customers it detects are unfamiliar with the product category, recommending best-fit products. It can be easily stretched to accommodate information from other parts of the corporation; a customer on record as being kept waiting for technical support could be offered a free gift by the commerce site.

Of course, all that capability doesn't come cheap. Artificial intelligence systems are expensive to build and maintain, and FrontMind is no exception at a base price of \$250,000. The high cost is liable to restrict the product to areas where extreme personalization pays off: huge corporate commerce sites that carry a wide range of very diverse products at relatively high profit margins.

Still, FrontMind is definitely a glimpse of things to come in Web site personalization. ■

the buzz

STATE OF THE MARKET

The competition

Manna isn't alone in the race to advance Web personalization. At least a dozen companies offer advanced personalization to some degree — and a few are incorporating artificial intelligence techniques for real-time personalization (though these tend to require fairly extensive rules creation up front). Still, three competitors could give Manna a run for its money:

NetPerceptions

■ You'll find this company's real-time recommendation tools in place on several major commerce sites, including CDnow.com and TicketMaster.com. Like Manna, it learns from customer interactions and reorganizes content to suit the customer's perceived needs. Also a start-up — the company was founded in 1996 — NetPerceptions sells both Web and call center tools based on the same learning and inference engine. **NetPerceptions**
Eden Prairie, Minn.
(612) 903-9424
www.netperceptions.com

BroadVision

■ Like Manna, BroadVision's One-to-One products offer an easy front end that lets managers control site presentation. They lack some of the learning capabilities of Manna's and NetPerceptions' products, but permit site fine-tuning and information rearrangement in real time, a step forward from older systems. Examples of BroadVision-tuned sites are owned by Cyberian Outpost (www.outpost.com), Hewlett-Packard Co. (www.shopping.hp.com) and Toyota Great Britain (www.toyota.co.uk). **BroadVision Inc.**
Redwood City, Calif.
(650) 261-5942
www.broadvision.com

Art Technology Group

■ The granddaddy of the group (started in 1991), ATG extended its Dynamo application server, the Dynamo Personalization System, to perform real-time personalization of commerce sites using an extensive series of rules. Although it lacks the more esoteric artificial intelligence features, Dynamo has so far proved extremely scalable in corporate enterprise settings. ATG tools have helped refine customer relationships at Garden Escape Inc.'s Garden.com and at Liberty Media Group's Sonic.net. **Art Technology Group**
Boston
(617) 859-1212
www.atg.com

Manna Network Technologies

By discerning site visitors' preferences in real time, its tool aims to satisfy them on the first try

Location: 44 Glen Ave.,
Newton, Mass. 02459

Telephone:
(617) 244-7545

Web site:
www.mannainc.com

Business: Dynamic customer personalization for Web commerce sites

Why you should watch them:

Unlike most Web personalization applications, Manna's tool works before the customer leaves the site. And it also can be fine-tuned by the marketing department, freeing IT resources.

Company officers:

- Dan Ross, CEO
- Ze'ev Rozov, managing director

Milestones: Founded in 1997; FrontMind for Marketing set to ship next month

Employees: 20; staff will likely double by summer's end

Product: FrontMind for Marketing, an artificial intelligence-based personalization package for Windows NT, Solaris and Linux platforms



MANNA'S MARKETING VP ELLEN RUBIN AND CEO DAN ROSS: Taking Web site personalization to the next level

Burn money: Funding provided by venture capitalists Advent International and a series of corporate investors as well as the Israeli government

Customers: Online supermarket Streamline Inc. in Westwood, Mass., (www.streamline.com) is already online with the product; Celebrity Webmasters Entertainment Boulevard in Marina Del Rey, Calif. (www.entertainmentblvd.com)

Potential stumbling blocks:

Sticker shock. FrontMind sells for \$250,000 for the base package

(which includes technical consultations) or via smaller upfront costs with a per-transaction fee. Either requires annual support contracts that amount to an additional 20% per year.

Getting your money's worth.

Developing the ancillary business processes to take full advantage of FrontMind's cross-selling and interdepartmental capabilities is a tall order, particularly if the corporation hasn't developed such practices off-line.

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TV Tuner Cards: Not Ready For Prime Time

BY DAVID STROM

THE IDEA of integrating television into your PC so you can catch the latest news on CNN or keep an eye on the World Series might seem like an innovative use of time and resources. TV tuner cards can do that, but the cards' reality falls short of their promise. Tuner cards on the lower end of the spectrum may be inexpensive, but they're time-consuming to set up and configure.

For this review, I looked at lower-end tuner cards that let you watch news broadcasts, review corporate train-

ing videotapes and capture information from broadcasts to distribute over an intranet.

I reviewed three tuner cards: AVerMedia Technologies Inc.'s TV/FM98, Pinnacle Systems Inc.'s MiroVideo PCTV and Desktop TV from STB Systems Inc., which recently merged with 3dfx Interactive Inc. Each does a rudimentary job of combining TV with the PC, eliminating the bother of a separate video monitor hogging desktop real estate.

To truly take advantage of each product, you'll want to connect them to cable TV or a high-end VCR — none of the three worked

well with the rabbit-ear antennae used to receive off-air broadcast signals. But even with more professional-quality connections or cable TV signals, the picture quality approached that of a cheap television: Colors were washed out, and images weren't sharp.

All three video tuner cards were difficult to set up and configure. They don't cost much in terms of purchase prices, but you'll end up spending hours installing and reinstalling their software, tracking down the latest video drivers, snaking the right audio cables through your computer and trying to debug your system.

My testing configuration

was a 200-MHz Pentium Pro with an S3G Trio video board from S3 Inc. and a Creative Labs Inc. Sound Blaster 16 audio card running Windows 95 and Windows 98. Although there are certainly more capable and expensive computing rigs, I selected components that are typical of a midrange corporate desktop system.

I tried a variety of TV signals and devices connected to each card, including VCRs and both consumer- and professional-quality video cameras.

Each product's operation is similar: You install a Peripheral Component Interconnect tuner card inside your PC and load the software and drivers. Then you connect the tuner card to your PC's audio card via an internal or external patch cable and hook up your video devices to the card's connectors. Each card differs in the kind of video connectors provided: Some offer only antenna-style input jacks while others come with S-video or composite RCA-style jacks (for more professional camcorder connections).

If you're the type of person who looks forward to updating

your Web browser and doesn't mind spending time opening up your PC, then the tuner cards will match your level of technical expertise.

With each product, you can capture still-video frames or a sequence of frames and save them to your hard disk, typically in the AVI format suitable for the Windows Media Player. Two of the cards — the Desktop TV and TV/FM98 — also receive FM radio broadcasts. Both managed much better reception than their respective TV components.

Although the cards are inexpensive, my advice is to hold off buying any of the three. Several promising technologies on the horizon will make capturing video a much easier experience. Microsoft Corp. and Intel Corp. are working together to provide video-programming interfaces for the newest Pentium Xeon III processors to be released this summer. But if you want to experiment in the meantime, consider the three tuner cards reviewed below. ▀

Strom is a freelance reviewer in Port Washington, N.Y.



AVERMEDIA's TV/FM98
featured the most stable software
of the three products reviewed

play, and its image capture and playback aren't too sophisticated. But its software appeared to be the most stable of the three products.

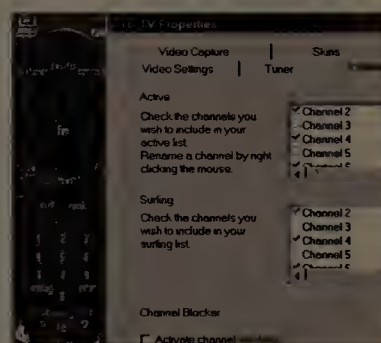
STB Systems

Desktop TV
\$130

www.stb.com, www.3dfx.com

STB's product comes with the most bundled software and features but offers the poorest off-air broadcast video display quality — not as sharp as the others and with poor color saturation. Included are a wide variety of remote control "skins," or user interfaces, and Asymetrix Learning Systems Inc.'s video editing tool, which appeared to be the most stable of the capture products tested. It supports both TV and FM radio tuning. Desktop TV wasn't able to run on my system when the display was set to 32-bit True Color, something the other two products handled with no problem.

It comes with external jacks for a TV antenna, an FM antenna, Audio In, S-video and Composite Video. To play the audio track from the tuner card, you first need to connect an



STB SYSTEMS' Desktop TV

internal jumper cable to your sound card — unlike the other cards, which use handier external audio cables. The cable didn't match the fitting for my Sound Blaster card, but I had another audio cable that did work.

Pinnacle Systems

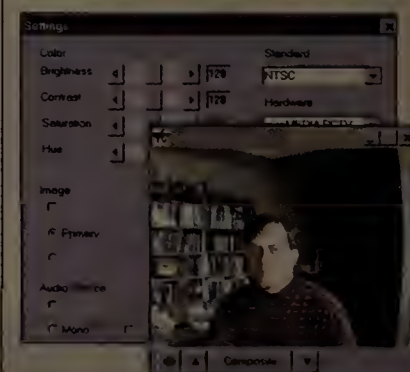
MiroVideo PCTV
\$99

www.pinnaclesys.com

Pinnacle has been one of the leaders in video-editing products for PCs, with a complete line of professional and advanced home-editing tools and kits in a wide range of prices. It will introduce in the U.S. this summer a video-capture card that will replace the PCTV card I tested.

The card has external jacks for a TV antenna, Audio Out, S-video and Composite Video and comes with a patch cable to feed audio directly into a sound card on the outside of the computer. When Pinnacle's Studio PCTV is available, it will include the company's video linear editing software along with the TV tuner card. Unlike the other two cards, it doesn't include an FM radio tuner.

I found the current card somewhat unstable. It kept forgetting the audio settings I used, requiring me to click on a series of configuration menus every time I ran the software. Its video-capture software controls are a bit difficult to operate, but the off-air broadcast quality of the displayed video was acceptable.



PINNACLE's MiroVideo PCTV

AVerMedia

TV/FM98
\$99

www.aver.com

The card includes two tuners: one for TV signals and one for FM radio. I had trouble getting the product to work with Windows 95, but it ran just fine with Windows 98. One of

the nicer features is the ability to split your computer screen into 16 monitors and watch broadcasts on numerous channels simultaneously.

The card has external jacks for a TV antenna, an FM antenna, S-video, Composite Video, Audio In and Audio Out and comes with a patch cable to feed audio into the sound card on the outside of the PC.

TV/FM98 has a very basic dis-

Policy-based Networking

BY CHRISTY WALKER

YOUR best customer just entered your extranet and wants to buy goods. At the same time, an internal employee wants to access her e-mail account. A decision must be made: Who is allowed to access the network first?

Policy-based networking is a way of making that decision. It's a set of automated rules that control network congestion. It governs which users and applications receive specified network bandwidth at any given time.

The need for policy-based networking is growing rapidly as organizations build complex intranets and extranets and

DEFINITION:

Policy-based networking is a set of automated rules to control congestion. These rules govern which users or applications can use specified network bandwidth at any given time. Policy-based networking helps manage user and application priority, quality of service and security rights, based on corporate policies.

open their networks to more users and applications. Policy-based networking enables network administrators to manage network security and network traffic so that important applications and users receive network priority over sec-

ondary applications and users.

"There is great demand for policy-based networking from the user side," says Charles Rutstein, an analyst at Forrester Research Inc. in Cambridge, Mass. "Everyone sees it as compelling to align technol-

ogy policy with business policy. It has the potential to change the way our networks work in a rapid way."

In order for policy-based networking to work, rules need to be established. These rules are based on business priorities that are set by business managers. For example, a CIO may mandate that the accounting department receives network priority at the end of each month.

In addition to business managers, network administrators and application managers must be involved in the implementation of a policy-based networking infrastructure.

Once rules are defined, they're stored in a central repository. Although there's no single recipe for a policy-based networking deployment, deployment often focuses on a separate policy server. The policy server receives traffic requests from switches, firewalls and important applications.

The server then culls policy information from the directory and dynamically configures the network based on the defined policies.

"The problem is in its complexity. We are unlikely to see widespread heterogeneous adoption of policy-based networking until beyond five years," Rutstein says.

The need for policy-based networking is particularly relevant today as voice and data traffic requirements push network bandwidth limits.

"It is a business necessity now as we see the convergence of mixing network traffic with real-time delivery require-

ments," says John Armstrong, an analyst at Dataquest in San Jose.

"Rather than throw raw bandwidth at network challenges and problems, companies need to manage their network and maximize bandwidth potential," he adds.

Although great in concept, there are roadblocks to policy-based networking. For starters, there are no standards, so vendors' products don't work well together. Also, many users find it difficult to decide who owns and creates the policies. But the biggest issue in preventing widespread adoption of policy-based networking is infrastructure costs.

"The most important thing ... [is] to make sure that you have a clear plan as to what you want to accomplish," says James Mancini, vice president of engineering at Virtual Networks Ikon, a division of Ikon Office Solutions Inc. in Irvine, Calif.

Mancini has helped deploy policy-based networking implementations for Ikon's customers, and he says he has noticed that "as networks become more congested... management will continue to increase." ▀

Walker is a freelance writer in Cambridge, Mass.

Q&A Looking At The Big Picture

American Management Systems Inc., an information technology consulting firm, identifies emerging tools and technologies at its Center for Advanced Technologies (AMSCAT). Specifically, AMSCAT researches and builds policy-based networking prototypes.

Ash Singh, director of AMSCAT's Next Generation Infrastructures lab in Fairfax, Va., talked to *Computerworld*.

How would you define policy-based networking?

It is about having a central console from which to configure network policies associated with security and [quality of service]. At a low level, it's about how this is implemented. You need to understand the business and application requirements themselves.

What advice would you give to a company developing a policy-based networking infrastructure?

Simplify your architectures. Don't get sold on the grand vision that every molecule on your network needs to be controlled. Architect the policy-based networking realistically, in a manageable fashion. Also, don't expect it to be a simple effort. There are a lot of pieces involved and expertise in many different areas that need to be coordinated.

What's the status of policy-

based networking?

You can do it today, but it's not a plug-and-play situation. You need expertise, including people [who understand] the networking side and next-generation devices like switches, routers, and [you need] those who understand the business value of its components. To put it all together is a fairly intensive systems integration effort.

Is it realistic to implement policy-based networking infrastructures today?

In terms of network traffic priorities, yes. But something as low-level as maintaining a policy for every user and every application... it is very unrealistic. In terms of security, it makes sense to do security on a roles-basis for, say, 100,000 users.

But if you try to do that on an individual, granular level, the management is a huge task. It is similar to phone companies and price plans. There are specific price plans that users can



AMSCAT's Ash Singh advises companies to simplify their architectures

chose between, but if they were to have unlimited, individualized price plans, it would be very difficult to manage.

Will the policy-based networking standards impact organizations?

Once the standards are in place, it will be easier to integrate several vendors' products, but the implementations of such standards will continue to be significantly different.

AT A GLANCE

To-Do List

Tips for implementing a policy-based network:

Build simple networks.

Involve business managers, network administrators and application managers when developing policies.

Use a single-vendor approach because standard aren't in place.

Classify users and information by role

Allow users to update network policies by using simple tools. For example, business managers should be able to change business-related policies without involving IT.

SOURCE: FORRESTER RESEARCH INC. CAMBRIDGE, MASS.

MOREONLINE

For more information about policy-based networking, visit our Web site. www.computerworld.com/more

Support Savings Drive



Office

Administrative tools and self-help features draw early adopters to Office 2000
By Kevin Burden

THE NEW VERSION of Microsoft Word is coming! Yee-haa — where does the line begin? It's been a long time since individual Office applications, such as Word, could stir much excitement. But make no mistake, Microsoft Corp. Office 2000, with all its 300M bytes of required disk space, is a major release. And several corporations that have tested it say they're ready to make the upgrade.

This latest edition of Microsoft's digital workhorse, due to ship June 10, reflects the vision that today's office

workers rely heavily on e-mail and the Web to do their jobs. Therefore, much of Microsoft's efforts went into building tools that simplify Web document publishing and that help utilize the Web as a platform through which users can collaborate and share documents.

Yet to beta tester Andrew Drooker, the new Web capabilities aren't compelling enough reasons to upgrade. "It's a very myopic view if they were. They are just features — they are not reasons to upgrade," says Drooker, who's vice president of network systems architecture at Turner Broadcasting Sales, the

sales arm of Turner Broadcasting Systems Inc. in Atlanta.

Drooker says Office 2000's support for the Zero Administration for Windows Initiative is a much better reason to upgrade, "because we can see a savings in support costs right away." Microsoft's initiative refers to a set of technologies that gives administrators tools for automating tasks such as operating system and application updates and provides a powerful console for central administration.

Drooker says he likes how the administrative capabilities fared in his tests,



LARRY LEIBROCK, chief technology officer at the University of Texas at Austin's Graduate School of Business, supports more than 1,000 desktop computers, 500 laptops and is moving to Office 2000

and he has given the go-ahead to upgrade all 1,000 systems in advertising sales by year's end.

From his tests, Drooker says, he's even more enticed by the self-repair aspects of the new suite. Office was designed to regularly check its applications' health, and, if necessary, fix errors. For example, if users accidentally delete executable files or load software that overwrites necessary Dynamic Link Libraries, Office 2000 automatically detects the errors and reinstalls the correct files from the distribution server, without interrupting the user's activities. "So users perceive less downtime from their mistakes, like loading software before checking with IT for its compatibility. And we get fewer calls to our help desk," Drooker says.

User errors aren't things information technology departments want to deal with any longer, says Larry Leibrock, chief technology officer at University of Texas at Austin's Graduate School of Business. Supporting more than 1,000 desktop computers, 500 laptops and 20 Windows NT and Unix servers, Leibrock's support issues are nearly identical to those of corporate IT. "We have people loading incorrect software all the time, so the self-repairing feature will significantly cut down our support costs. This is a very important attribute for any company that is debating the upgrade," he says.

In addition to saving on help desk calls through the self-repair feature, Office 2000 also promises to reduce costs by allowing IT to establish and distribute several common operating environments. Office 2000 is fully componentized, according to Microsoft, so each workgroup can now have its own customized installation, unlike Office 97, in which one configuration for everyone is the only option.

Drooker is taking full advantage of this new flexibility at Turner. Each workgroup is getting a configuration

tailored specifically to its needs, Drooker says, "because why put something on a user's desktop that they don't need?" For instance, the interactive group will get FrontPage, but the salespeople won't. "It makes administration cost sense: I don't want someone in marketing playing with FrontPage and possibly messing up our Web site. We also don't need to pay for licenses for machines that don't need FrontPage."

Custom installations will also solve a compatibility issue for Turner's accounting group. They'll get Office 2000 but remain on Excel 97. That's because Turner uses PeopleSoft Inc. applications, which aren't yet compatible with the new Excel.

Collaboration

Leibrock says he will use Office 2000 to establish an atmosphere of collaboration at the University of Texas. That's because the school's corporate advisers told the school they want graduates who know how to work in teams. "They told us to stop sending them lone cowboy technicians and start sending them collaborators," Leibrock says.

Office 2000 lets users share and alter documents in real time, directly within their Web browsers. Office makes that possible by letting users choose HTML, the Web programming language, as their native format rather than having to convert to HTML, which is required

OFFICE 2000 SPECS

Office 2000 is available in five suite options. The most comprehensive is Office 2000 Premium, which includes:

COMPONENTS

- Word 2000
- PowerPoint 2000
- Publisher 2000
- Small Business Tools
- PhotoDraw 2000
- Excel 2000
- FrontPage 2000
- Outlook 2000

COSTS

\$799 for new users

\$399 for an upgrade

\$499 if you're jumping ship from a non-Microsoft suite

The beta Office 2000 program included 700,000 customers in 43 countries, 10 times larger than all previous Office evaluation programs. They were each charged \$19.95 for Office 2000 Premium.

PROS

Outlook 2000 is the one application worth upgrading for, says Andrew Drooker at Turner Broadcasting Sales. "It's the one program in Office that is vastly improved over its 97 version." Rules Wizard is the best new feature, letting users file, forward or delete junk e-mail, Drooker says.

in Office 97. So posting documents to the Web in Office 2000 is as easy as saving to the hard drive, Leibrock says.

The collaboration capabilities are what swayed Denver-based software vendor J. D. Edwards & Co. to upgrade to Office 2000. The company is turning it into an industrial-strength publishing system to replace the Interleaf Inc. system it currently runs. But it's also counting on the collaboration features to improve communication between its software developers and those who write the documentation.

"Staying current with the developers has been a perennial problem for the publications team. [Real-time collaboration] should improve documentation quality tenfold over what we've been able to do through pushing e-mail around," says Kip Wheeler, systems architect for worldwide publications.

J. D. Edwards will initially confine collaboration to its four-building campus but plans to use it with Office's language translation capabilities. "We haven't tested it to see if it works. But we'd like to get feedback from our European offices in real time rather than after we publish," Wheeler says.

Drooker is also interested in Office's collaboration features because users will be able to work together without a third-party product. "Microsoft NetMeeting is great for collaborating, but you need NetMeeting. With Office 2000, you just need a browser, which most users are very familiar with." ▀

We have people loading incorrect software all the time, so the self-repair feature will significantly cut down our support costs.

**LARRY LEIBROCK, CTO,
UNIVERSITY OF TEXAS**

Unix, Net: '60s Brainchildren

BY MARY BRANDEL

THE 1960s ended with a bang: As it had hoped since the early 1960s, the Advanced Research Projects Agency (ARPA) saw the Arpanet — the network that we now know as the Internet — take shape in the last year of the decade. And at Bell Laboratories in Murray Hills, N.J., a group of computer programmers built the first version of a multiuser time-sharing operating system called Unix. In time, the two events would converge, with Arpanet borrowing heavily from its birth-year twin.

The Arpanet came to life in 1969 when — with the help of Bolt Beranek and Newman Inc. in Cambridge, Mass., and teams of grad students and programmers — the first four nodes went live at the University of California at Los Angeles, the University of California at Santa Barbara, the University of Utah in Salt Lake City and Stanford Research Institute in Stanford, Calif. The four-node network was fully operational the following year.

One of the early problems to solve on the Arpanet was establishing standard commands that all participants would use. "A group of graduate students from the University of Illinois at Urbana said, 'Hey, look at Unix. This is the thing we should be using on the network,'" says Peter Salus, author of *Quarter Century of Unix*, (1994, Addison-Wesley Publishing Co.). For example,

commands such as file transfer protocol come from Unix.

Those wouldn't have been available had it not been for the work of Ken Thompson, Dennis Ritchie, Doug McIlroy and others at Bell Labs. All had been working on the Multics project, a \$7 million, seven-year effort to create the first multiuser, multitasking operating system. Bell Labs withdrew from the project in 1969, and the group was disappointed about losing Multics' interactive computing environment.

"There was a lot of unhappiness at the Labs," Salus explains. "So Ken and Dennis, with Doug's prodding, decided they'd try to write a system that would make them happy."

Thompson wrote the operating system essentials in one month. "He set a timetable of doing one week each on the kernel, file system, editor and compiler," Salus says. "At the end of that time, he had a barely functioning system." Not named until 1970, the system would be called Unix, a play on the word Multics.

Less straightforward was securing funding for further development of the operating system. After Bell Labs turned down their request for a PDP-10 computer, Thompson and Ritchie "scruffed up an

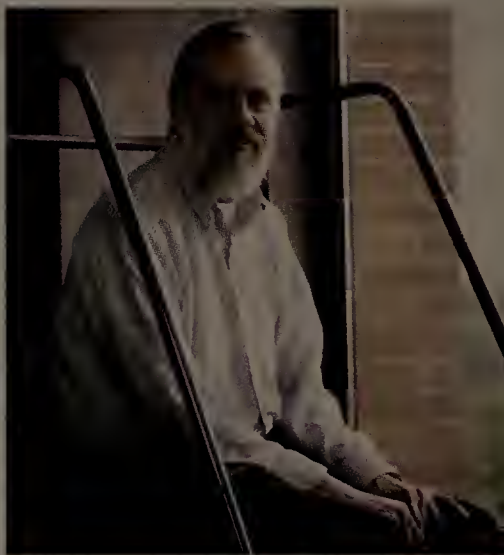
unused PDP-7 that was being stored in a closet," Salus says. Unix was first implemented on that machine.

The two eventually obtained a PDP-11 by promising AT&T Corp. a Unix-based text-processing application.

But the turning point for Unix was in 1973 when Ritchie devised a language called C, which he used to rewrite the operating system. Because C was a high-level language, it greatly reduced the difficulty of porting Unix to different hardware platforms.

It was this version of Unix that Ritchie and Thompson presented to about 200 people at the Symposium on Operating System Principles in 1973. "This was one of the first

1969



DENNIS RITCHIE helped create the Unix operating system at Bell Labs



KEN THOMPSON and colleagues persevered to make Unix a reality after Bell Labs withdrew support

'wow' papers," Salus says. "Almost immediately, people started calling up asking if they could get copies of this new operating system."

Many characteristics made Unix attractive. It was written in a high-level language and had a hierarchical file system. It was also designed to be simple yet powerful, both in terms of the user interface and the way you could build complex programs by combining several smaller, simpler ones.

"Here was an actual functioning operating system, and it worked," Salus says.

More interest was generated in 1974, when Thompson and Ritchie published a paper in *Communications of the ACM*.

About 40 organizations asked for copies of Unix during that first year, Salus says.

In the next several years, many versions of Unix emerged. By 1984, about 100,000 sites were running Unix on various platforms. Today there are more than 5 million installations. "Neither Dennis nor Ken ever dreamed it would still be in use 30 years later," Salus says. ▶

Brandel is a frequent contributor to Computerworld. Contact her at brandel@cwix.com.

Technology Happenings

■ **IBM unbundles its software** products, allowing customers to buy software separately from its computers, creating the software market.

■ **Data General Corp.** introduces the Nova, a 16-bit minicomputer.

■ **Xerox purchases Scientific Data Systems Inc.** for \$1 billion.

■ **Nieman Marcus'** holiday catalog features the "Kitchen Computer System." The system includes a Honeywell Inc. H-316 minicomputer and keyboard console, costing \$10,000.

Space

■ **July: Neil Armstrong and Edwin "Buzz" Aldrin and Michael Collins** travel to the moon aboard *Apollo 11*. Armstrong becomes the first man to walk on the moon.

■ **November: Aboard *Apollo 12*,** Charles Conrad, Richard Gordon and Alan Bean make the second landing on the moon.

Born in 1969

■ **Jakob Dylan**, lead singer of the Wallflowers, son of **Bob Dylan**

■ **Brett Favre**, quarterback, Green Bay Packers

■ **Sergei Federov**, Detroit Red Wings

■ **Ice Cube**, rapper

■ **Marilyn Manson** (Brian Warner), rock singer

Other Notables

■ There are **65 airplane hijackings**.

■ The U.S. prime rate is raised three times, ultimately reaching **8.5%**.

■ **Musicians** Eric Clapton, Ginger Baker and Steve Winwood form **Blind Faith**.

■ **Canadian government** allows U.S. military draft dodgers and deserters to settle in Canada.

■ **Underdog New York "Miracle" Mets** beat the Baltimore Orioles in the World Series.

■ **Beatle Paul McCartney** marries Linda Eastman; **John Lennon** marries Yoko Ono.

■ **Best Picture: *Midnight Cowboy***. It was originally rated X.

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

President Nixon authorizes the secret bombing of Cambodia.

Massachusetts Sen. Ted Kennedy's car accident at a bridge on Chappaquiddick Island results in the death of Mary Jo Kopechne.

A half-million people attend the three-day Woodstock music festival at Max Yasgur's Farm in upstate New York.

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

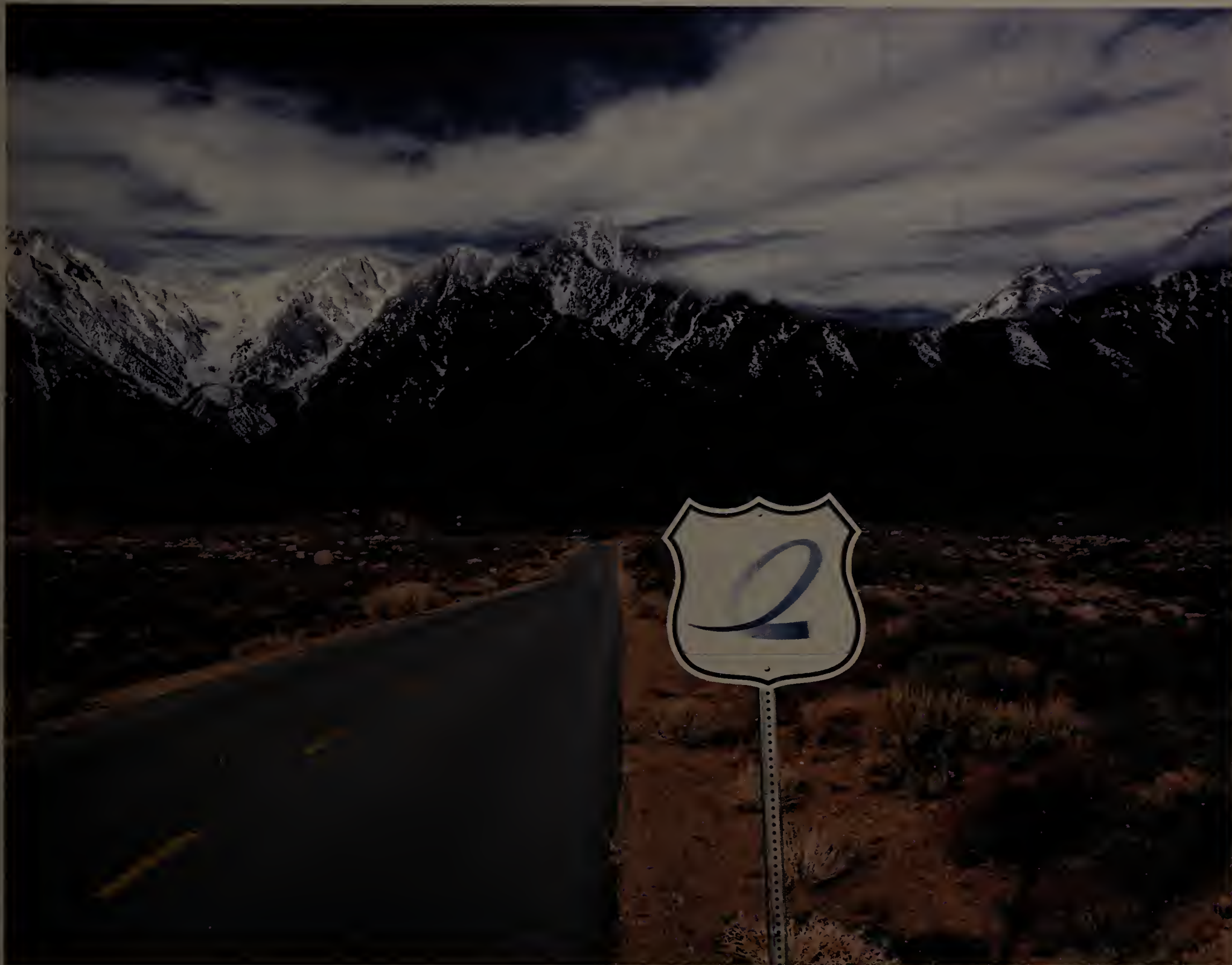
President Nixon orders the removal of 25,000 of the 540,000 troops in Vietnam.



Actress Sharon Tate and six others are brutally murdered by Charles Manson's cult.

The U.S. Supreme Court orders immediate desegregation throughout the country.

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Midwest Lures Family-Based IT

Des Moines, Iowa, and Omaha combine up-to-date IT opportunities and technologies with traditional values and lifestyles
By Kim Fulcher Linkins

FAMILY VALUES, a strong work ethic and friendly folk are all things you think about when someone mentions the Midwest. But one phrase people don't always associate with the region is "high technology."

Des Moines, Iowa, and Omaha are welcoming a growing population of information technology professionals as people seek an area where they can not only hone their technical skills, but can also experience an environment conducive to raising a family.

The skills most in demand in Des Moines and Omaha include C++, Java, Cobol, programming, database administration, network engineering and client/server expertise, according to industry experts.

The area is dominated by insurance and financial services firms and is also host to companies in the food, telemarketing and health care industries.

"There's more high technology here than many people realize," says Dan Connolly (dconnolly@alegent.org), CIO at Alegent Health in Omaha.

"There is an incredibly robust telecommunications infrastructure that was initiated due to the Strategic Air Command being positioned here, just south of Omaha," Connolly says. "There are a number of national companies

with their headquarters here, which would surprise many folks."

Fortune 500 companies in Omaha include ConAgra Inc., Mutual of Omaha Insurance Co., Berkshire Hathaway Inc., Inacom Corp. and Peter Kiewit Sons Inc.

Fortune 500 companies in Des Moines include Principal Financial Group; nearby Newton, Iowa, is home to Maytag Corp.

American Dreamin'

"The No. 1 draw for a person with a family is [that] the school systems are wonderful, and the

day's labor, a fair day's wage," says Bill Scales, chief technology officer at Principal Capital Management LLC, a subsidiary of Principal Financial Group. "I think the work culture is one that is a participatory culture. They will pitch in to get the job done. But IT professionals in Des Moines can expect approximately \$41,000 for entry level, \$55,000 for junior-level people and from \$60,000 to \$70,000 for senior-level personnel."

"If you can spell information systems, I think you can start out at about \$27,000 to \$30,000," Connolly says. "And if you are a very skilled, technically competent individual, it's not ... all that difficult to get a job in the \$60,000 to \$70,000 range, which is a pretty fair living in this town."

"In addition to trying to offer competitive wages, companies in the area try to employ retention strategies designed to invest in the career paths of the employees," says Carol Campbell (ccampbell@fnni.com),

We don't expect people to be working around the clock.

**DAN KING,
WELLMARK BLUE CROSS/
BLUE SHIELD OF DES MOINES**

IT professionals also like a challenge. Mark Beckwith, senior vice president at Norwest Financial Information Services Group in Des Moines, says his company is going through a technology transition, the nature of which can also attract IT talent.

After recruiting people to the area, many companies have found that one of the best retention methods involves help-

Who's In Demand?

Percentage of Midwest IT managers hiring for the following positions in 1999:

JOB TITLE	PERCENT
Network administrator/analyst	23%
PC technical support specialist	27%
Senior programmer/analyst	18%
Programmer/analyst	32%
Webmaster/Web designer	23%

SOURCE: COMPUTERWORLD 1999 ANNUAL JOBS FORECAST SURVEY



Des Moines skyline

general ethics and morals of the community and area in itself," says Dan King (kingdp@wellmark.com), group leader of IT services at Wellmark Blue Cross/Blue Shield of Des Moines.

"A lot of people think of Omaha as being out in the middle of nowhere and being a flat desert," Connolly adds. "That's not the case. It's hilly. It's generally lush and green [with] lots of trees in town."

IT professionals can enjoy the lush environment because the work environment is relaxed. "We're not quite as busy as New York. We don't expect people to be working around the clock," King says. "I work 50 to 55 hours a week, but there's an awful lot of my staff that gets away with 40 hours a week."

"People believe in a fair

second vice president of service delivery at First National Bank of Omaha. "No one wants their skills to become stale or obsolete, so one of the big attractions is our robust training program to keep the skills alive." Her company just retrained many of its mainframe programmers to be Web programmers, she says.

Talent Search

Hiring managers report mixed results in trying to find enough talent locally and in recruiting from out of state.

Marsha Blum, director of human resources and customer services at Union Pacific Railroad Co. in Omaha, says the company must go to metropolitan areas like Minneapolis — and sometimes Texas — to recruit more experienced IT people.

ing employees get to know one another in a relaxed setting. Midwest companies also offer signing bonuses, stock options, paid time off and flexible work schedules to recruit and retain IT professionals, Blum says.

Experts say the most important thing to remember when recruiting to the Midwest is that it isn't a one-way street.

Says Kurt Kline (kurt.kline@mutualofomaha.com), first vice president of human resources at Mutual of Omaha: "We want people to know about us and we want to know about them to make sure that this is the best possible match for them and for us." ▀

Linkins is a freelance writer in Austin, Texas. She can be contacted at KPLinkins@aol.com.

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Ruan Transportation	200	Univ. of Nebraska Med. Center	100
Freedom Group	160	First Data Infosource	80

SOURCE: DIRECTORY OF TOP COMPUTER EXECUTIVES, ACR COMPUTER RESEARCH INC., 1998

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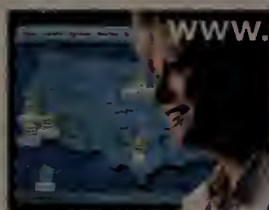
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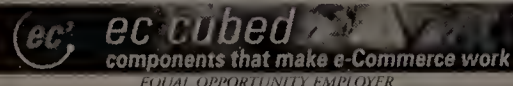
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SOFTWARE ENGINEER to analyze, design, develop and test object oriented applications developed specifically for the telecommunications industry using programming tools and environments such as C++, Solaris, TCP/IP Oracle, Delphi, Red Brick, Windows NT, Windows 95 and Call Detail formats from the following telephone network switches at multiple software levels: Ericsson, Northern Telecom (AMA), employing advanced UNIX features on the Sun platform. Such as memory map files, shared memory libraries, IPC methods and performance analysis. Require: B.S. in Computer Science and five years experience fit the job offered or as Software Consultant/Developer. Salary: \$57,000/year, 40 hours/week, 8 am to 5 pm, M-F. Mail resume to: Manager, Human Resources, MCI WorldCom, 500 Clinton Center Drive, Clinton, MS 39056, Ref. Job Number JX97-0327.

ORACLE DATABASE ADMINISTRATOR to administer large production databases in Oracle under HP UNIX and Sun Solaris environment; install, configure, upgrade and patch the Oracle and UNIX servers; tune the system global areas for dedicated and multithreaded server configurations; write shell scripts for logical and physical backups; simulate crash scenarios and test recoverability of the system; develop data models using relational design principles and map the data models to data definition language and implement integrity using dynamic data replication; integrate Oracle database with Oracle Web server, Developer 2000 and PowerBuilder; analyze problems in Oracle Transparent Network substrate (SQL*NET); conduct database and system audits using Enterprise Manager and Performance Pack, and implement business logic using Pro*C, PL/SQL, C/C++ and UNIX. Require: M.S. in Computer Science and four years experience in the job offered or any experience providing skills in performing above duties. Salary: \$75,000 per year, 40 hours/week, 8:30 am to 5 pm, M-F, 40 hours per week. Mail resume to: Vice President, StaffWorks, Inc., 724 West Lancaster Avenue, Suite 206, Wayne, PA 19087.

Senior Microcode Development Engineer - Duties include advanced research, definition, programming, implementation, and testing of ICDA (Integrated Cache Disk Array) product line as well as algorithm design and development of advanced real-time network features for future generations of the ICDA (Integrated Cache Disk Array) product line. Requirements include a Master of Science Degree in Electrical Engineering, Computer Science or related field and five years of pre- or post-degree experience in job offered or related field of high level and assembler programming of time-critical real-time systems, development of network Operating Systems level features and encryption and digital signature algorithms. Applicants must have unrestricted authorization to work in the United States. Salary \$75,000/year, 40 hours/wk. Respond with two copies of resume to Case #19981506, P.O. Box 8968, Boston, MA 02114.

Principal Consultant - Analyze, design, code & test moderate to difficult computer software apps using Oracle tools such as Developer/2000 & 3rd-generation languages such as C, C++ & Java. Develop interfaces, data conversion routines & custom extensions to Oracle application software products, such as Oracle Financials, Manuf. & H.R. Analyze, design, configure, size, install, implement, tune & administer Oracle databases & application software. M.S. Comp. Sci., Engng, Math or Info. Sys. & no experience, or B.S. in Comp. Sci., Engng, Math or Info. Sys. plus 5 yrs of progressively responsible experience as Software Engineer, Systems Analyst or Programmer Analyst req'd. Must have experience working w/ Relational Database Management Systems (kernel) & RDBMS product development), as well as system analysis/design. High mobility preferred. 40 hrs/wk, 8 am to 5 pm, \$59,592/yr. Qualified & interested applicants submit resume to Charlene Cogley, Manager, Beaver Falls Job Center, 2103 Ninth Ave., Beaver Falls, PA. Reference Job Order No. 2025257.

SOFTWARE ENGINEER to design, develop, test, and implement software systems for various business process applications such as materials management, production planning, product costing, sales & operations planning, and materials requirement planning using SAP R/3 in a client/server environment; Evaluate and map the business process of an organization; Design and develop reports for management of client company using ABAP/4 language. Require: Master's degree in Computer Information Systems, Business Administration, or a closely related field, with one year of experience in the job offered; Extensive paid travel on assignments to various client sites within the U.S. is required. Salary: \$65,000 per year, 8:00 am to 5:00 pm, M-F. Apply by resume to: Saravana Swaminathan, President, Bellsoft, 3545 Cruise Road, Suite 309-G, Lawrenceville, GA 30044, Attn Job ST

SOFTWARE ENGINEER to provide specialized consultancy services to design, develop, analyze and install custom software in C++ and shell programming running UNIX operating system; network systems running on various platforms using UNIX sockets, and TCP/IP; develop interactive software based on C/XTLib in Geographical Information System (GIS) using X-Windows graphical environment, Motif Toolkit under Sun/HP; program in C/C++ to develop real time applications; design and develop RDBMS applications using Sybase/DB-Library; and telecommunications protocols. Require: M.S. in Computer Science and two years experience. Experience gained before or after obtaining M.S. will be acceptable. 40% travel required to customer's sites within the United States. Salary: \$60,000 per year, 8 am to 5 pm, M-F. Apply with resume to: President, Compucum, Inc., 10 Mansell Court East, Roswell, GA 30076-4823.

System Analyst: Software development in a proprietary fourth generation language (4GL, Capture). Implementation of changes to existing manufacturing software application from written design specifications. User interaction with SOL/RDBMS and UNIX systems (SUN and HP). UNIX shell script generation. Interaction with customers both at ICC/GRS's Manufacturing Execution System (MES) application. Must have at least a BS degree in CS or Computer Engineering and two yrs. of exp. in above position or two yrs. exp. as System Analyst or rel. position w/ability to use: UNIX, 4GL, C/C++, MS Windows, RDBMS, MS Word/Excel, and able to work in a manufacturing environment. 40.0 hr/wk. \$58,006/yr. 8:00 AM-5:00 PM. Applicants send resume to: Attn: Job Code: SA, Genrad, Inc., Human Resources, 7 Technology Park Drive, Westford, MA 01886-0033

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain application software and databases in a UNIX environment using Informix (On-Line, Dynamic Server, 4GL, SE), ESOL-C, ANSI-C, Oracle Developer 2000, Oracle Designer 2000 and UNIX shell scripting. Require: B.S. degree in Computer Science/Engineering, or a closely related field, with 2 years of experience in the job offered; Extensive travel on assignment to various client sites within the U.S. is required. Salary: \$60,000 per year, 8:00 am to 5:00 pm, M-F. Apply by resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation, 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096; Attn: Job AJ

Systems Analyst, Job Order # NC7221973, DOT Code 030-167-014. Design, development, testing, on-call support & maintenance of computer projects on IBM 3090 mainframe computer with MVS/ESA Operating Systems using IDMS/R Database. Required: Programming in COBOL, COBOL II, DC-COBOL, ISPF Programming (User Interface), IBM Utilities, SYNCSORT, OS/VS and JCL. Testing using ADSALIVE and XPEDITER. Minimum education & experience: BS Engineering, Computer Science or equivalent degree plus 1 & 1/2 yrs experience. Salary: \$58,000/yr. 40hrs/wk. Apply to the nearest North Carolina Job Center or submit resume to: Job Service, 700 Wade Avenue, PO Box 27227, Raleigh, NC 27611 Refer to: Job Order Number NC7221973. All resumes must include the applicant's social security number.

SOFTWARE DEVELOPER: MARTINEZ, GA. DEVELOP INTERNET APPLICATIONS ON PC'S USING C, C++ AND COM/OLE, DCOM, ACTIVE X AND WINDOWS, AND NT INTERNALS, AND OBJECT ORIENTED PROGRAMMING. BACHELOR'S DEGREE IN COMP. SCI., MATH OR ENGG. PLUS 3 YRS. EXP. IN JOB OFFERED. 40 HRS/WK, 9AM-5PM. MON-FRI. COMPETITIVE SALARY. SEND RESUME TO RCG#1, IPSWITCH 81 HARTWELL AVE., LEXINGTON, MA 02421.

Systems Analyst wanted by investment banking co. in Greenwich, CT. Must have Master's in Comp. Sci or Electrical Engg & 2 yrs exp analyzing, dsngng, dvlpng, coding, testing, implmtg, enhancing & maintaining fin'l systems applics, incl data systems used by Controllers Div for regulatory & fin'l reporting functions, such as VAR & P/L, using Win NT, C/C++, UNIX Shell & Perl scripts & Sybase in C/S envrmt. Analyze & implmt user req't's using knowledge of fin'l instruments, incl, options, FX forwards, swaps & other deriv instruments. Respond to Dave MacWilliams, Greenwich Capital Markets, Inc., 600 Steamboat Rd, Greenwich, CT 06830.

Programmer needed, by Computer Consulting & Systems Integration Co. in Westbury, NY, to dvlp s/ware prgms using Visual C++ & VB prgmg langs & Winsock and MAPI protocols. BA/BS in Comp Sci or closely related field req'd. Respond to HR Dept., Darby Corporate Solutions, Inc, 865 Merrick Ave, Westbury, NY 11590. Fax: 516-832-7101. E-mail: HumanResources@darby-group.com

Analyst Programmer - Charlotte, NC-Analyze reqs, design, code, test & implement info mgt sys using NATURAL/ADABAS & COBOL. M-F, 8AM-5PM, 40 hrs/wk, \$45,000/yr. Req: Bach in Comp. Sci., Math or Engr & 2 yrs exp. Send resume with SS# to: Job Service, 500 W. Trade St., Charlotte, NC 28202, JO# NC 2617223, DOT Code 030.162-014

WEBMASTER

BEAVER COLLEGE seeks a full time **WEBMASTER** with 3-5 years experience in web development. Bachelor's Degree & knowledge of IIS, ASP & JAVA required. NT experience preferred. Send resume to: **Human Resources, Box ITR, Beaver College, 450 S. Easton Rd., Glenside, PA 19038. AA/EOE.**

Software Engineer needed by Computer S/ware Dvlpmnt & Consulting Services Co. in Iselin, NJ. Must have 1 yr exp analyzing, dsngng & dvlpng s/ware systems using Win NT and Unix; analyzing, dvlpng & implmtg business applic to code using VB, Oracle & C and configuring systems using SQL*Plus and SQL*Loader. Design and develop full cycle testing automation using Win runner and Load runner. Masters in Engg or Comp Sci req'd. Respond to: HR Dept, Cimtech, Inc, 200 Middlesex Turnpike, Iselin, NJ 08830.

Senior Software Engineer wanted by Technology Products Co. in Cambridge, MA. Must have MS in Comp Sci & 2 years Systems Software experience. Respond to: HR Dept, VenturCom, Inc., Five Cambridge Center, Cambridge, MA 02142.

Software Engineer needed by Computer S/ware Dvlpmnt & Consulting Services Co. in Iselin, NJ. Must have 1 yr exp analyzing, dsngng & dvlpng s/ware systems using Win NT and Unix; analyzing, dvlpng & implmtg business applic to code using VB, Oracle & C and configuring systems using SQL*Plus and SQL*Loader. Design and develop full cycle testing automation using Win runner and Load runner. Masters in Engg or Comp Sci req'd. Respond to: HR Dept, Cimtech, Inc, 200 Middlesex Turnpike, Iselin, NJ 08830.

Software Engineer needed FT by a Software Dvlpmnt Co in MA to research, dsngn & dvlp comp s/ware systems in conjunction with h/ware product dvlpmnt. Must have Bach in Comp Sci or related field or equiv. Respond to: HR Dept., General Applied Technologies Corporation, 121 Brick Kiln Rd., Chelmsford, MA 01824.

Software Engineer, Stamford, CT; Analyze, design and develop Client/Server applications using Visual Basic, PowerBuilder, MS SQL Server and Access using Object oriented analysis and design methodologies. Req'd. Masters* in Engineering or Computer Science or Math. 1 year experience in job offered or 1 year experience in Computer Related Profession. *Will accept Bachelors degree and five (5) years of experience in lieu of Masters. 40 hrs/wk., 9:00am-6:00pm. Send resume to Matrix Information Technologies Corporation, 77 Prospect Street, Stamford, CT 06901.

Software Engineer wanted by Software Consulting Co. in Princeton, NJ. Must have Masters in Comp Sci and 2 yrs exp analyzing, dsngng, dvlpng, testing & implmtg business applic systems using PowerBuilder, VB, Sybase System 11 in Win 95/NT, Solaris, UNIX/C envrmts. Respond by resume to: HR Dept, Princetec, Inc, 25 Jefferson Plaza, Princeton, NJ 08540.

System Engineer wanted F/T by Computer S/ware Design & Network Service Co. in Edison, NJ. Must have BS in Comp Sci or Comp/Electrical Engg and 5 yrs software experience. Respond to: HR Dept, Computer Square, Inc, 274 Raritan Center Pkwy, Edison, NJ 08837.

Consulting Software Engineer wanted by Info Tech Consulting Co. in Piscataway, NJ. Must have Masters in Comp/Systems Sci, or Elec. Engg and 2 yrs exp dsngng, dvlpng, prgmg, testing & implmtg moderate to high complexity comp info systems using OOP, C++, Perl & SQL. Respond to: HR Dept, Silverline Industries, Ltd., Silverline Corporate Plaza, 53 Knightsbridge Rd, Piscataway, NJ 08854.

Programmer/Analyst needed by IT Co. in Union, NJ. Must have BS degree & 3 yrs exp as VB Prgrmr/Analyst to dvlp Windows based applics using Oracle & SQL Server and engaging in bldg applics on Internet. Respond to: HR Dept., Patel Consultants Corporation, 1525 Morris Ave, Union, NJ 07083.

Programmer/Analyst required by Comp. Services Co. in Rochelle Park, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg and 1 yr exp planning, dvlpng, testing, documenting & customizing comp s/ware for business applics using RPG and OS/400 w/ORACLE and INFORMIX d/bases in a UNIX envrmt. Respond to: HR Dept, JGI, 201 West Passaic St, Rochelle Park, NJ 07662.

Computer Programmer/Analysts (multiple positions) wanted by S/ware Dvlpmnt & Comp Consulting Co. in Lawrenceville, NJ 08648. Must have 2 yrs software exp. Bachelor's in Comp Sci, Engg or Info Sci req'd. Respond to: HR Dept, Atlanta Technologies & Systems, Inc, 3371 U.S. Rte 1, Ste 218, Lawrenceville, NJ 08648.

Sys. Adm/Developers/Analysts/Programmers (Jr/Sr level). Master's deg. or Bachelor's in Comp Sci. or related, + 1 to 5 yrs. exp. in Oracle 7.x, SQL, PL/SQL, PRO*C, C++, Rogue Wave, UNIX, SQL Forms 3.0/4.5, Powerbldr, Rep. Writer, Dev/Des 2000, Shell Scripting, COBOL, COBOL II, Vis. Foxpro, SAP, Peoplesoft, and/or other exp. Salary comm w/exp. Fax resume to: CPU, Inc, Atlanta, Fax No. 770-921-8384

Senior Applications Consultant needed by Boston, MA Co. involved in Professional Internet Intranet Services. Must have BS in Electronics Engg and 1 yr web applications experience. Respond to: Jane DeSimone, HR Dept, @ Extraprise.com, Extraprise Group, 27 Melcher St, 3rd Floor, Boston, MA 02210.

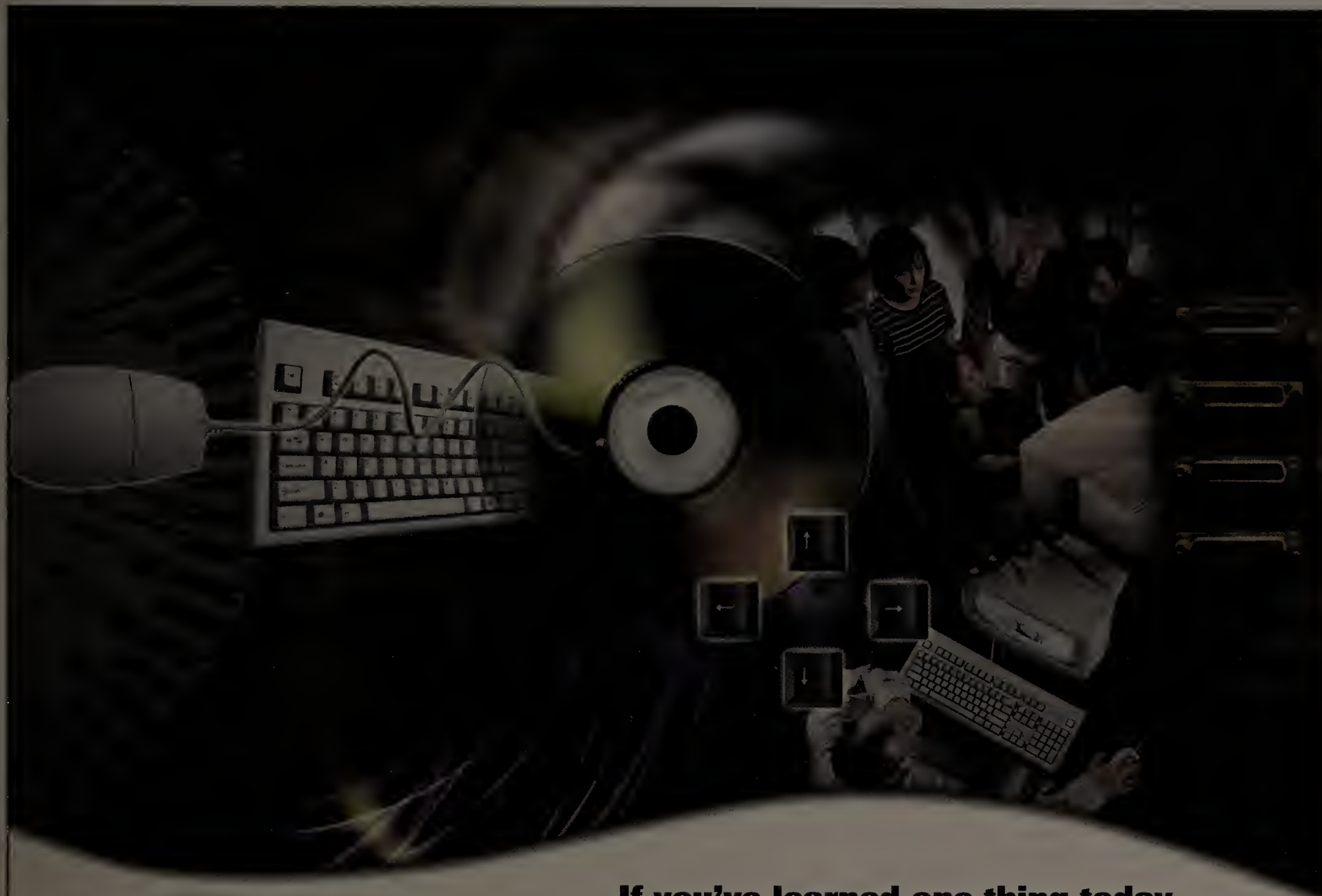
Software Engineer III needed by Mfr of Measurement Equipmt for Semiconductor Industry in Westwood, MA. Must have Masters in Comp Science field, math or electrical engineering and 1 yr experience. Respond to: Shayna Strauss, HR Dept, ADE Corporation, 80 Wilson Way, Westwood, MA 02090-1806

International Systems Analyst/Programmer wanted by Financial Asset Mgmt Co. in Boston, MA. Must have 2 yrs experience in PROGRESS and BS in Comp Sci or related engg discipline. Respond to: HR Dept, The Pioneer Group, Inc, 60 State St, Boston, MA 02109.

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Senior Software Engineer (3 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience using: 1 of Group A and 1 of Group B and 1 of Group C; OR 1 of A and 2 of B, OR 1 of A and 2 of C as follows: Group A - Windows 3.1, Windows 95, Windows 98, Windows NT, UNIX, HP-UX, IRIX, Sun OS; Group B - Visual C++, Visual C, C, C++, Visual Basic, PowerBuilder; Group C - JAVA, TCP/IP, HTML, MFC, CGI, PERL, ASP, COM/DCOM, Active X, MTS. Must have 1 year of experience in job offered or as a computer professional. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics. Will accept B.S. degree with five years of experience as computer professional. Salary is \$75,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Washington Job Center Manager, Millcraft Center, Suite 150 LL, 90 West Chestnut Street, Washington, PA 15301; Job Order No.: 9096433.

Senior Software Engineer (8 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience required using: 1 of Group A and 3 of Group B OR 2 of A and 2 of B as follows: Group A - Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B Oracle Forms, Oracle Reports, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL* Reports. Work involves extensive travel and frequent relocation. Must have one year of experience as a senior software engineer or as a computer professional and a Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept B.S. degree or foreign equivalent with five years of experience as computer professional. Salary: \$75,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. James Mackin, Actg. Mgr. Pittsburgh North Job Center, 1122 Western Ave., Pittsburgh, PA 15233, Job Order No.: 2025337.

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Senior Software Engineer or Computer Professional, who will develop software systems, applying computer science, engineering, and mathematical analysis, requiring supervision of other computer professionals, with 1 year of experience using: 1 of A and 2 of B; or 2 of A; or 1 of A and 1 of B and 2 of C. A) Oracle, Ingres, Sybase, Access, Informix RDBMS, Case Tools; B) PL/SQL, ES-QL/C, SQL, SQL Plus, Report-writer, Loader, Menu, Pro * C, DBA, Sequel Server, Server Manager, Powerbuilder, Forms and/or Reports (AKA Developer 2000); C) Windows, Unix. Analyzes software requirements and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in one of several limited fields: computer science, engineering, mathematics, chemistry, physics, business, economics, or in another field of science. Will accept Bachelor's degree plus 5 years experience as a computer professional in the specialty in lieu of the Master's degree. \$70,000/yr. 40hrs/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 5025105, to Mr. Tom Dembosky, Manager, Indiana Job Center 350 N. Fourth Street, Indiana, PA 15701.

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Senior Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using relational data base management systems (RDBMS). Work involves extensive travel and frequent relocation. Must have 1 year of experience using 1 from Group A and 2 from Group B OR 1 from A and 1 from B and 1 from C OR 1 from A and 2 from C. A) DB2, FoxPro, Informix, Ingres, MS-Access, Oracle, Paradox, Sybase and Unify; B) AIX, DOS, HP-UX, MVS, Novell, OS/2, Sun OS, UNIX, VAX/VMS, Windows; C) 4GL, APT, C, C++, COBOL, Case Tools, C Shell, Crystal Reports, E-SQL, Easytrieve, JAVA, ODBC, PowerBuilder, PowerDesigner, Power J, Power++, S-Designer SQL, Shell Script, Visual Basic. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Will accept B.S. degree with five years of experience as computer professional. Salary is \$70,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Terry Kinney, Manager, Armstrong County Job Center, 1270 N. Water Street, PO Box 759, Kittanning, PA 16201. Job Order No.: 2025386

Software Engineer Ann Arbor, MI for Object Oriented analysis, design and development of software for data mining using Visual C++. Design and development of query processors to process the user submitted queries and find the solution to Query using efficient tree-traversal, search and sort algorithms in Visual C++ using object-oriented design methodology and advanced Windows NT programming. M-F 9am, - 6pm, 40hrs/wk. \$78,000/annum. Require B.S. in Computer Science, Engineering, Maths or equivalent and two years exp. in the job offered or two years exp. as a Systems Analyst, Programmer Analyst or equivalent. Experience must comprise design and development of software using SQL, Visual C++, and Windows NT. 100% employer paid travel within the US possible. Send resumes with the reference number included to MJC/ESA, P.O. Box 11170, Detroit, Michigan 48202. Reference No. 172898SG. Employer paid ad.

Programmer/Analyst (variable jobsites throughout the U.S. multiple positions): Design, development, coding, testing and implementation of client-specified applications using COBOL, CICS and DB2. \$65,000/yr, 40 hrs/wk Mon - Fri. 9am - 6pm. REQD: 2 yr. exp. in job offered. Apply at the Texas Workforce Commission, Dallas, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas; 78701, Job Order # TX0520280. "Ad Paid by An Equal Opportunity Employer"

Senior Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience using: 1 of Group A and 1 of Group B and 1 of Group C; OR 2 of A and 1 of B; OR 2 of A and 1 of C as follows: Group A - DB2, IBM3090, IBM ES9000, MVS, IMS, IDMS; Group B - CL/400, CICS, TSO, VSAM; Group C - TELON, COBOL, JCL, AS/400, RPG/400, COBOL/400. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics. Will accept B.S. degree with five years of experience as computer professional. Salary is \$70,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Ms. Barbara Cole, Supervisor, Greene County Team PA Career Link, 4 West High Street, Waynesburg, PA 15370. Reference Job Order No.: 5025054

Senior Software Engineer (4 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience required using: 1 of Group A and 3 of Group B OR 2 of A and 2 of B as follows: Group A - Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B Oracle Forms, Oracle Reports, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports. Work involves extensive travel and frequent relocation. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept B.S. degree or foreign equivalent with five years of experience as computer professional. Salary: \$70,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Ron Marsh, Manager, Alle-Kiski Job Center, 3 Kensington Square, New Kensington, PA 15068. Job Order No.: 8050331

Software Designer/Member Scientific Staff - Design, develop and maintain real-time call processing software for a digital switch based wireless code division multiple access telecommunication system. Design, develop and test network management operation administration and maintenance functions for system using object oriented methodology and programming languages, and database design. Write design documentation. Requires Master's degree in Computer Science or Electrical Engineering and one year experience in the job offered or as a Research Associate, Engineer, or Software Engineer. Experience must include one year designing software using object oriented methodology and programming languages, and database design. (May be pre or post Master's.) M-F, 8:00 am to 5:00 pm, \$60,800 per year. Apply at the Texas Workforce Commission, Dallas, Texas, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701, J.O.# TX0611272. Ad paid by an Equal Opportunity Employer.

Software Engineer (2 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience required using: 1 of Group A and 3 of Group B OR 2 of A and 2 of B as follows: Group A - Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B - Oracle Forms, Oracle Reports, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports. Work involves extensive travel and frequent relocation. Bachelors degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Salary: \$60,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Washington Job Center Manager, Millcraft Center, Suite 150 LL, 90 West Chestnut Street, Washington, PA 15301; Job Order No.: 2025380

Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience as a software engineer or computer professional and one year of experience using: 1 of Group A and 1 of Group B and 1 of Group C; OR 1 of A and 2 of B; OR 1 of A and 2 of C as follows: Group A - Windows 3.1, Windows NT, Windows 95, Windows 98, Unix, HP-UX, IRIX, Sun OS; Group B - Visual C++, Visual C, C++, Visual Basic, PowerBuilder; Group C - JAVA, TCP/IP, HTML, MFC, CGI, PERL, ASP, COM/DCOM, ActiveX, MTS. Bachelor's degree or foreign equivalent in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics. Salary is \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. James Clarke, Mgr, Uniontown Job Center, 32 Iowa St., Uniontown, PA 15401; Job Order No.: 7050321

Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience required as a software engineer or computer professional and one year of experience using: 1 of Group A and 3 of Group B OR 2 of A and 2 of B as follows: Group A Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B Oracle Forms, Oracle Reports, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports. Work involves extensive travel and frequent relocation. Bachelor's degree or foreign equivalent in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or a scientific or business related field. Salary: \$65,000 per/yr, 40 hrs/wk., 9:00 - 5:00 p.m. Please submit resumes to: Mr. Duane M. Brentzel, Mgr. Greensburg Job Center, 599 Sells Lane, Greensburg, PA 15601; Reference Job Order No.: 1025253.

Software Engineer - Ann Arbor, MI to provide technical guidance in development of SQL query acceleration products. Improve query performance using query optimization tools and algorithms. Implement query acceleration algorithms. Develop code in C++ on a windows NT platform. M-F 8am - 5pm. 40 hrs/wk. \$50,000/annum. Require B.S. in Electrical & Computer Engineering or equivalent and one year's exp in the job offered or one year's exp as a Software Developer, or Equivalent. Experience must comprise software design and development using C++, SQL, Windows 95/NT, SQL query acceleration and query optimization. 100% employer paid travel within the U.S. possible. Send resumes with reference number included to MJC/ESA, P.O. Box 11170, Detroit, Michigan 48202, Reference No. 172998SG. Employer paid ad.

Senior Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have six months experience as a senior software engineer or computer professional and six months of experience using SAP. Masters degree in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Will accept B.S. degree with five years of experience as computer professional. Salary is \$100,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Greg Schwing, Mgr., Mon Valley Job Center, 345 Fifth Ave., McKeesport, PA 15132; Job Order No.: 2025331.

Programmer-Analysts (3) entry or experienced. Evaluate client requirements for human resource management system; configure modules to adapt to existing systems and new requirements utilizing C++ language; convert existing data, design and enter data into databases applying knowledge of Oracle, Sybase and DBMS; test configuration and data conversion; develop additional functionality applying knowledge of software development tools; design and develop user interfaces to accomplish client requests; train client personnel. B.S. degree or equivalent in Com. Sci, Business, Math, or other. \$40,000/yr. up, commensurate with exp., skills. Send resume to: ARGUS Integrated Solutions, Inc. 15 Piedmont Center, 3575 Piedmont Road N.E., Suite 820, Atlanta, Georgia 30305.

Senior Software Engineer (2 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience using SAP as well as one year in the job offered or as a computer professional. Masters degree in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Will accept B.S. degree with five years of experience as computer professional. Salary is \$105,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. John McCraley, Mgr., Butler County Job Center, 227 West Cunningham Street, Butler, PA 16003; Job Order No.: 7050315

Senior Software Engineer (2 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience using Baan as well as one year of experience in the job offered or as a computer professional. Masters degree in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Will accept B.S. degree with five years of experience as computer professional. Salary is \$105,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Richard Introcaso, Mgr., Beaver County Job Center, 120 Merchant Street, Ambridge, PA 15003; Job Order No. # 8050422

Senior Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience as a senior software engineer or computer professional and at least one year of experience with PeopleSoft. Masters degree in Computer Science/Applications, Engineering, Math, Physics, Chemistry or a business or scientific field. Will accept a Bachelors degree with five years of experience as a computer professional. Salary is \$105,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Ms. Joan Lang, Mgr., Pittsburgh West Job Center, 32C Elmar Drive, Pittsburgh, Pa 15205; Job Order No.: 5025118.

Software Engineer (2 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience using SAP. Bachelors degree in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Salary is \$80,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. James Woods, Acting Manager, Pittsburgh East Job Center, 6206 Broad Street, Pittsburgh, PA 15206; Job Order No.: 2025335

Software Engineer Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have at least six months of experience using PeopleSoft and 1 year of experience in job offered or as a computer professional. Bachelors degree in Computer Science/ Applications, Engineering, Chemistry, Math, Physics or a business related field. Salary is \$35,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Greg Schwing, Mgr., Mon Valley Job Center, 345 Fifth Avenue, McKeesport, PA 15132; Job Order No.: 5025111

Programmer/Analyst sought to participate in the implementation of a Year 2000 Compliance Project which entails programming and testing in COBOL II, in a CICS, DB2, IMS environment. Bachelors or equivalent in Computer Science, Engineering or a related field + 6 months exp as a Programmer/Analyst or 6 months as a Programmer. Training, education, or experience must include COBOL, DB2, and CICS. Will accept training at a recognized Computer Training Institute in lieu of experience in the Job Offered or a related occupation. Applicant must be willing to travel to various client sites throughout the U.S. Salary: \$56,000/yr. Send 2 resumes to: Case #: 80321, PO Box #: 8968, Boston, MA 02114.

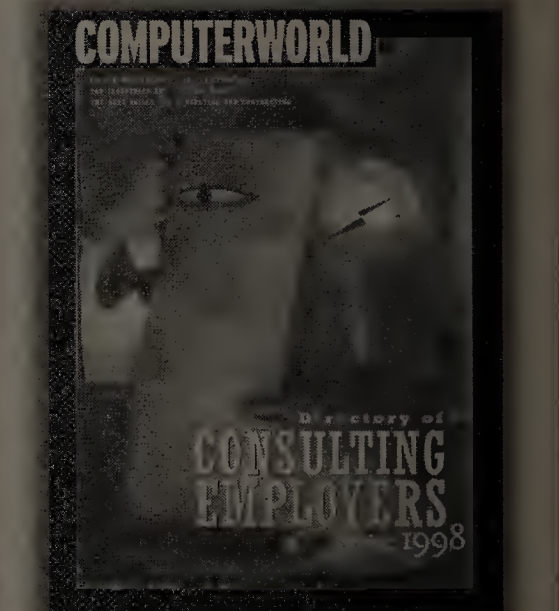
Software Engineer with 2 years experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years experience using MVS, COBOL, CICS, JCL, and VS-AM. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: computer applications, engineering, mathematics, or physics \$60,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 1025243, to: Mr. James Mackin, Actg. Manager, Pittsburgh, PA 15233.

Software Engineer with 2 years experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using Java and C++. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in one of several limited fields: engineering, mathematics, computer applications, or physics. \$88,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 909-6511, to: Mr. James Woods, Acting Manager, Pittsburgh East Job Center, 6206 Broad Street, Pittsburgh, PA 15206.

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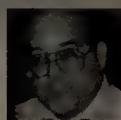
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IDX Systems	46.4
Manugistics Group Inc.	38.6
Cambridge Technology Ptnrs	32.6
Wind River Systems Inc.	31.1
Cabletron Systems	30.9
The Vantive Corp.	30.1
The Baan Co. N.V.	29.1
Computer Horizons Corp.	26.5

DOLLAR

ADC Telecommunications Inc.	8.63
Lexmark International Group (H)	8.38
IDX Systems	8.06
Hewlett-Packard Co. (H)	7.81
Shared Medical Systems	7.69
Tech Data	7.69
Teradyne	5.81
Intuit	5.69

LOSERS

PERCENT

Edify Corp. (H)	-18.6
@home Corp.	-12.6
Excite, Inc.	-12.6
US West	-12.4
Dell Computer Corp.	-11.7
Panamsat	-11.3
Sterling Commerce Inc.	-10.6

DOLLAR

Excite, Inc.	-19.25
@home Corp.	-18.81
Qualcomm	-11.69
IBM	-9.75
Yahoo Inc.	-7.81
US West	-7.50
SGS-Thomson Microelectronics	-7.25

UNISYS LANDS ON STEADY GROUND

Focus on services market drives vendor's revenue

BY JAIKUMAR VIJAYAN

THE INFORMATION technology services business is paying off big-time for Unisys Corp. The once-struggling mainframe vendor has racked up five better-than-expected quarters in a row, trimmed operating costs and increased formerly drooping revenue. It nearly doubled profits between 1997 and last year.

Unisys finished 1998 with revenue of \$7.2 billion, compared with \$6.6 billion in 1997. Profits, at \$387 million, were up 94% from \$199 million a year ago. Earnings per share grew 130% to \$1.06 in the same period. The company's stock has risen steadily from about \$27 six months ago to just under \$34 last week.

"They have far exceeded expecta-

tions both in terms of the [speed] of their financial improvement and the degree to which they have improved their [long-term prospects]," said Richard Jacobs, an analyst at Janney Montgomery Scott Inc. in Philadelphia.

Much of that momentum is the result of its tight focus on the services business, a strategy begun by former CEO James Unruh and accelerated by current CEO Lawrence A. Weinbach, who took charge of an ailing Unisys in September 1997 after an eight-year stint as chief executive of Andersen Worldwide.

Weinbach's strategy has centered on selling services such as large-scale systems integration and maintenance.

Unisys has also developed hardware, software and service bundles for vertical industries that include the financial services, transportation and government sectors.

Today, more than 68% of Unisys' revenue comes from such services — a figure that Weinbach says he hopes to push to 75% in the next few years. It has also slashed debt and repurchased more than half its stock, saving millions of dollars in interest and dividend payments.

"The new management has fashioned a comeback that few of us believed they would be capable of pulling off" so quickly, said Michael Geran, an analyst at Pershing, a division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J. "The challenge will be to grow it from here." ■

INDUSTRY ALMANAC

SOFTWARE UP 8.3%

EXCH	52-WEEK	RANGE	MAY 21 2 PM	WK NET CHANGE	WK PCT CHANGE
ADBE	81.06	23.62	Adobe Systems Inc. (H)	78.44	5.44 7.4
AZPN	56.87	6.12	Aspen Technology Inc.	10.50	2.00 23.5
ADSK	49.43	21.62	Autodesk Inc.	27.63	1.63 6.3
AVIO	46.25	11.06	Avid Technology	17.69	-0.25 -1.4
808J	42.50	6.12	Business Objects S A	29.75	2.75 10.2
CON	39.00	10.62	Cadence Design Systems	13.19	0.69 5.5
C8TSY	63.87	6.68	C8I Group Plc.	16.50	2.38 16.8
CHKPF	56.00	10.87	Checkpoint Software	45.00	1.50 3.4
CTXS	53.75	23.12	Citrix Systems Inc.	47.75	0.00 0.0
COGNF	28.12	14.75	Cognos Inc.	25.25	0.63 2.5
CA	61.93	26.00	Computer Associates	45.31	0.56 1.3
CPWR	40.00	16.37	Compuware Corp.	28.13	3.13 12.5
DCIM	54.50	9.37	Documetum	14.06	1.19 9.2
EFIL	52.00	13.50	Electronics For Imaging	48.00	0.25 0.5
HNCSS	47.12	13.75	Hnc Software	27.69	2.25 8.8
IOXC	55.75	12.43	IDX Systems	25.44	8.06 46.4
IFMX	14.00	3.50	Inform Software Inc.	7.56	0.56 8.0
INTU	110.75	34.18	Intuit	79.19	5.69 7.7
JKHY	55.00	26.43	Jack Henry Associates	36.25	-0.38 -1.0
JOEC	49.50	10.87	J.D. Edwards & Co.	19.13	1.50 8.5
LGTO	67.75	23.50	Legato Systems Inc.	48.25	3.13 6.9
MACR	50.00	12.31	Macromedia Inc.	46.81	3.44 7.9
MANU	59.75	5.25	Manugistics Group Inc.	10.88	3.03 38.6
MENT	15.06	5.43	Mentor Graphics	13.38	0.44 3.4
MSFT	95.62	41.43	Microsoft Corp.	77.81	0.25 0.3
NETA	67.68	10.06	Network Associates	15.56	2.56 19.7
GMH	63.87	30.37	Network General	58.38	-2.88 -4.7
NOVL	28.12	9.50	Novell Inc.	24.63	0.25 1.0
ORCL	41.18	12.25	Oracle Corp.	25.88	1.81 7.5
PMTC	36.31	8.50	Parametric Technology Corp.	13.38	1.19 9.7
PSFT	52.12	11.50	PeopleSoft Inc.	16.31	2.25 16.0
PIXR	66.00	27.50	Pixar	42.88	-4.00 -8.5
PLAT	34.31	9.00	Platinum Technology Inc.	26.00	1.25 5.1
RATL	35.62	10.50	Rational Software Corp.	32.13	-0.81 -2.5
SAP	60.12	23.75	SAP AG	36.00	3.31 10.1
SCUR	29.00	3.25	Secure Computing Corp. (L)	4.09	0.03 0.8
SE	48.75	20.12	Sterling Commerce Inc.	38.00	-4.50 -10.6
SSW	32.81	18.56	Sterling Software Inc.	22.94	0.06 0.3
SORC	25.75	7.50	Structural Dynamics Research	20.25	0.38 1.9
SYBS	11.62	4.50	Sybase Inc.	9.00	0.13 1.4
SYMC	32.43	8.68	Symantec Corp.	23.69	3.56 17.7
SNPS	61.25	24.50	Synopsis	45.00	2.75 -5.8
SCCT	30.87	7.81	Systems & Computer Technology	17.63	1.84 11.7
BAAF	47.25	6.87	The Baan Co. N.V.	12.75	2.88 29.1
VNTV	30.75	5.00	The Vantive Corp.	10.00	2.31 30.1
TSAT	51.00	26.00	Trans. Sys. Arch.	33.69	0.63 1.9
VRTS	90.12	23.75	Veritas Software Corp.	79.75	1.13 1.4
WIND	34.43	11.25	Wind River Systems Inc.	19.75	4.69 31.1

TELECOMMUNICATIONS CARRIERS OFF -1.3%

ATI	107.68	42.25	Airtouch Communications (H)	104.56	5.13 5.2
AT	72.43	38.25	Alltel Corp.	69.75	0.50 0.7
AIT	69.93	41.50	Ameritech Corp.	63.63	-1.94 -3.0
ANOW	23.00	10.37	Andrew Corp.	15.94	1.31 9.0
T	64.12	32.25	AT&T	59.88	0.25 0.4
BCE	51.06	25.62	BCE Inc.	48.19	1.69 3.6
BEL	61.18	40.43	Bell Atlantic	55.44	-1.56 -2.7
BLS	50.00	31.93	Bell South	47.56	2.31 5.1
CSN	23.43	8.50	Cincinnati Bell Inc.	23.13	0.94 4.2
CMCSK	42.56	16.81	Comcast	39.13	-0.13 -0.3
CQ	39.62	21.75	Comsat Corp.	32.94	-0.19 -0.6
COX	88.87	41.50	Cox Communications Inc.	84.81	2.19 2.6
GSTRF	32.31	8.31	Globalstar Telecom. Ltd.	19.88	-1.75 -8.1
GTE	71.81	46.56	GTE Corp.	64.44	-0.94 -1.4
NXTL	42.50	15.37	NexTel Communications	36.00	-2.06 -5.4
SPOT	58.18	26.37	Panamsat	30.38	-3.88 -11.3
QCOM	119.75	18.87	Qualcomm	100.31	-11.69 -10.4
SBC	59.93	35.00	SBC Communications	50.63	-1.63 -3.1
FON	114.62	54.43	Sprint Corp.	108.50	2.63 2.5
TDS	68.37	30.62	Telephone and Data Systems (H)	66.13	-0.38 -0.6
USW	66.00	46.81	US West	53.06	-7.50 -12.4
VIA	48.75	24.62	Viacom	41.38	1.88 4.7
WCII	56.12	10.25	Winstar Communications Inc.	49.94	-4.44 -8.2
WCOM	94.87	39.00	MCI Worldcom Inc.	85.50	-1.31 -1.5

SERVICES UP 6.0%

ACXM	31.25	16.50	Accion Corp.	28.00	0.06 0.2
ACS	51.75	22.37	Alliased Computer Servs	41.00	0.13 0.3
AMSY	40.25	19.25	American Mgt. Systems	34.13	3.75 12.3
AUD	46.87	30.81	Automatic Data Processing	44.88	0.19 0.4
BSYS	59.37	35.37	Bsys Group, Inc.	54.19	1.69 3.2
CATP	58.37	10.62	Cambridge Technology Ptnrs	19.56	4.81 32.6
CEN	40.50	24.00	Ceridian	35.81	1.06 3.1
CBR	40.87	13.31	Ciber Inc.	21.63	0.88 4.2
CDO	30.87	10.75	Comdisco	25.25	-0.25 -1.0
CHZR	44.75	9.25	Computer Horizons Corp.	17.63	3.69 26.5
CSC	74.87	46.25	Computer Sciences	64.56	5.50 9.3
DST	70.56	34.00	Osi Systems Inc.	52.88	-0.63 -1.2
EDS	58.63	30.43	Electronic Data Systems (H)	58.63	3.38 6.1
FOC	46.25	19.68	First Data Group	44.81	0.81 1.8
FISV	40.75	24.62	Fiserv	37.88	0.63 1.7
IT	35.62	17.31	Gartner Group	24.06	-0.06 -0.3
KEA	60.93	17.25	Keane	30.06	1.56 5.5
NDC	55.25	26.18	National Data	46.75	5.19 12.5
PAYX	55.06	33.12	Paychex Inc.	45.00	-2.00 -4.3
REGI	23.06	4.00	Renaissance Worldwide	7.00	0.00 0.0
REY	23.50	12.62	Reynolds & Reynolds	22.25	-0.19 -0.8
SFE	120.00	17.12	Safegard Scientifics	84.94	-3.81 -4.3
SAPE	82.87	24.25	Sapient Corp.	72.00	-2.25 -3.0
SMS	86.50	40.06	Shared Medical Systems	67.25	7.69 12.9
SOS	41.93	21.68	Sungard Data Systems	35.94	4.25 13.4
SYNT	32.43	8.68	Syntel Inc.	23.69	3.56 17.7
TECD	53.12	14.50	Tech Data	38.69	7.69 24.8
TSS	26.25	14.43	Total System Services, Inc.	18.81	-0.19 -1.0
TSAT	51.00	26.00	Transaction Sys. Architects	33.69	0.63 1.9

NETWORK UP 0.4%

COMS	51.12	20.00	3Com Corp.	29.25	0.69 2.4
ADCT	52.25	15.75	AOC Telecommunications Inc.	49.69	8.63 21.0
ANTC	34.18	11.50	Antec	30.56	-1.81 -5.6
ASND	102.56	32.62	Ascend Communications Inc.	93.38	-0.50 -0.5
BNYN	19.37	2.12	Banyan Systems Inc.	12.31	-0.31 -2.5
CS	15.31	6.62	Cabletron Systems	14.31	3.38 30.9
CNEBF	18.75	5.75	Call Net Enterprises	7.13	0.38 5.6
CSCF	122.31	41.12	Cisco Systems Inc.	113.38	-3.19 -2.7
ECILF	45.00	19.75	ECI Telecom	36.63	0.44 1.2
FORE	34.62	9.25	Fore Systems Inc.	33.88	-0.13 -0.4
HRS	51.00	27.31	Harris Corp.	40.25	1.88 4.9
GMH	63.87	30.37	Hughes Electronics/GM	58.38	2.88 4.7
ERICY	34.00	15.00	LM Ericsson	27.69	0.63 2.3
LU	67.00	26.68	Lucent Technologies	57.38	-1.06 -1.8
MADGF	6.75	1.75	Madge Networks	3.25	0.19 5.5
NCDI	8.96	4.37	Network Computing Dev	5.25	0.06 1.2
NWK	17.25	7.31	Network Equipment Tech	9.00	-0.19 -2.0
NN	39.87	15.43	Newbridge Networks	29.63	-0.44 -1.5
NOK	85.68	29.50	Nokia Corp.	71.88	5.00 6.5

EXCH	52-WEEK	RANGE	MAY 21 2 PM	WK NET CHANGE	WK PCT CHANGE
NT	79.00	26.81	Northern Telecom Ltd. (H)	73.00	5.00 8.8
PAIR	20.12	6.00	Paragon Technologies Inc.	19.25	1.06 7.4
PCIL	11.12	4.31	Pictetel	9.13	-0.63 -6.4
SFA	39.75	11.75	Scientific Atlanta	36.63	0.13 0.3
TLA8	63.93	15.68	Tellabs Inc. (H)	59.69	1.38 2.4
USW	66.00	46.81	US West	53.06	7.50 12.4
VRIL	9.12	2.12	Verilink	3.56	-0.13 -3.4
WSTL	11.62	2.75	Westell Technology Inc.	6.31	-0.25 -3.8

SEMICONDUCTORS, CHIPS & EQUIPMENT UP 0.9%

AOPT	30.06	7.87	Adaptec (H)	30.08	3.08 11.3
AMO	33.00	9.31	Advanced Micro Devices	20.25	1.50 8.0
ALTR	41.25	14.12	Altera (H)	36.44	-1.75 -4.6
AOI	43.81	12.00	Analog Devices	39.25	-1.44 3.5
AMAT	71.62	21.56	Applied Materials	60.06	0.06 0.1
ASML	50.37	12.93	ASM Lithography Holding	45.00	1.88 4.3
HRS	51.00	27.31	Harris Corp.	40.25	1.88 4.9
INTC	71.87	32.87	Intel Corp.	57.00	-0.69 -1.2
KLAC	65.00	20.75	Kla Instruments	49.44	-2.13 -4.1
LTC	64.12	19.56	Linear Technology	56.56	0.50 0.9
LSI	40.93	10.50	LSI Logic (H)	38.19	-0.06 -0.2
MXIM	65.12	22.31	Maxim Integrated Products	56.53	0.72 1.3
MU	80.56	20.06	Micron Technology	37.75	0.63 1.7
MOT	88.87	38.37	Motorola	84.56	1.25 1.5
NSM	22.75	7.43	National Semiconductor (H)	20.25	-1.75 -8.0
STM	128.00	35.87	SGS-Thomson Microelectronics	114.13	7.25 6.0
SLR	57.87	17.68	Solicon Corp.	54.81	0.13 0.2
TER	66.50	15.00	Teradyne	54.25	5.81 12.0
TXN	117.87	45.37	Texas Instruments	112.06	3.44 3.2
UNPH	148.00	31.25	Uniphase	138.00	-0.19 -0.1
VTSS	59.00	17.12	Vitesse Semiconductor Corp.	49.94	0.44 0.9
XLNX	54.37	14.87	Xilinx	47.56	0.81 1.7

COMPUTER SYSTEMS OFF -0.8%

AAPL	50.00	25.62	Apple Computer Inc.	43.06	-1.63	-3.6
ASPX	12.50	1.62	Auspec Systems	11.69	-0.06	0.5
CPO	51.25	22.25	Compaq	25.25	0.38	1.5
DGN	21.81	7.00	Data General	13.75	1.38	11.1
OELL	55.00	19.31	Dell Computer Corp.	37.19	-4.94	-11.7
GTW	84.50	36.12	Gateway 2000 Inc.	61.25	-5.06	-7.6
HWP	97.56	47.06	Hewlett Packard Co. (H)	93.25	7.81	9.1
HIT	78.93	40.18	Hiachi Ltd	68.00	-5.25	-7.2
I8M	246.00	106.00	I8M	230.00	-9.75	-4.1
MUEI	24.75	9.37	Micron	10.13	-0.31	3.0
MOT	88.87	38.37	Motorola	84.56	1.25	1.5
NATI	38.12	17.50	National Instruments Corp.	36.94	0.06	0.2
NCR	55.75	23.50	NCR	41.94	-0.25	0.6
NIPNY	60.50	31.00	NEC	54.50	-0.75	-1.4
PRCM	13.25	3.43	Procom Tech Inc.	4.75	-0.81	20.6
SQNT	18.87	5.68	Sequent Computer Systems	12.75	-1.00	-7.3
SGI	20.87	7.37	Silicon Grafix	11.81	-0.19	-1.6
SNE	104.31	60.25	Sony	91.75	-0.88	-0.9
SUNW	72.50	19.18	Sun Microsystems	60.44	-3.00	-4.7
TEXM	5.93	2.00	Texas Micro	4.75	-0.06	-1.3
TRCD	4.87	0.37	Tricord Systems	2.91	-0.19	6.1
UIS	36.37	17.62	Unisys	34.81	1.31	3.9

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Most Companies Already Bitten by Y2K Bug

Most glitches minor, but some suppliers ditched

BY THOMAS HOFFMAN

On the surface, the figures are startling — 72% of 152 large companies have already experienced some sort of Y2K-related glitch, according to newly released results in an ongoing survey by New York-based Cap Gemini America LLC and Rubin Systems Inc. in Pound Ridge, N.Y.

To date, most of the prob-

lems have been minor, with a negligible impact on the bottom line, observers said.

"We've had a couple of minor Y2K glitches with minimal impact," said Jerry Miller, CIO at Sears, Roebuck and Co. The Hoffman Estates, Ill.-based retailer ran into a snag a few months ago when one of its partners entered Y2K-sensitive software code into an electronic data interchange system they both use. The result: Sears was unable to schedule orders with the manufacturer for a few days, Miller said.

Y2K observers wonder how many big problems companies are covering up to avoid shaking shareholder confidence.

"If companies are hiding these problems, they're being covered up very, very well," said Kazim Isfahani, an analyst at Giga Information Group Inc. in Cambridge, Mass.

For example, one major pharmaceutical company destroyed at least \$500,000 worth of drugs after the expiration dates on the packaging were misprinted and mistaken for having been past due, said Ca-

pers Jones, chief scientist at Artemis Management Systems Inc. in Burlington, Mass.

The study also found that 8% of the 152 companies and 14 government agencies surveyed have severed business relationships with a supplier, partner or customer.

Prudential Insurance Company of America, widely said to be a year 2000 front runner,

had replaced several of its suppliers by this time a year ago because of concerns about their Y2K readiness, said Irene Dec, year 2000 program director for the Newark, N.J.-based insurer. ▀

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Continued from page 1

J. D. Edwards

are having to mix the applications said they don't regret choosing J. D. Edwards.

But the mixed installations mandate that they use the AS/400 as their database server, and the users said the two applications require separate approaches to training, security and administration.

Company Mixer

Mixing packages wasn't part of the plan for buyers such as Granite Rock Co., a Watsonville, Calif., paving contractor and maker of construction materials that wanted to base its enterprise resource planning (ERP) system just on OneWorld.

"But then the reality set in," said Steve Snodgrass, Granite Rock's corporate controller. When the company began using J. D. Edwards' software a year ago, he said, a mixed installation "was really the only option" because applications such as payroll and fixed-asset management were missing from OneWorld.

For a follow-on implementation that went live last month at its construction division,

Granite Rock ended up using just the AS/400 green-screen software after tests of OneWorld bogged down its wide-area network.

Dave Girard, chief operating officer at Denver-based J. D. Edwards, conceded that early releases of OneWorld "were not production-ready and stable" across the board. Consequently, the company late last year set up a 50-employee team to work free of charge with users to help resolve problems with OneWorld's manufacturing applications.

The SWAT team is now "working through the final throes of problems in that area," Girard said. He added that a OneWorld upgrade due in mid-June should fully stabilize the software and round out its functionality with missing pieces such as support for managing contract billing.

J. D. Edwards — which this week is due to report a first-quarter operating loss of more than \$25 million — expects the B73.3.1 upgrade to make it possible for users to meet all their needs with OneWorld. "That's the magic bullet," Girard said.

John Reinhardt, a consultant at Decision Technologies Inc. in Fremont, Calif., who works on OneWorld installations, said next month's upgrade should be "a watershed release" for the software.

But Reinhardt said a current client — the orthopedics unit of Johnson & Johnson Inc. in

New Brunswick, N.J. — still plans to start with a mixed installation of OneWorld and the WorldSoftware green-screen applications this summer while waiting for other users to test out the upgrade.

OSF Inc., a Toronto-based maker of retail-store displays, is another user that was forced to split its installation between the two J. D. Edwards applications. As a result, "we basically have two different systems accessing the same data," said David Mudie, a senior application specialist at OSF.

For OSF, Mudie added, the OneWorld upgrade won't eliminate the need for the green-screen software. The company doesn't expect to get a version of OneWorld supporting Canadian payroll requirements for at least another 18 months, he said.

Granite Rock hopes to begin migrating its construction division to OneWorld in September by combining the B73.3.1 release with Microsoft Corp.'s Windows Terminal Server software to relieve the pressure on its WAN.

But the green-screen applications probably won't be fully eliminated until 2001 at the earliest, said Brad Stimson, Granite Rock's project manager. In the meantime, the division's workers will have to switch back and forth between the products. "To the users, this is not going to be transparent," Stimson said. ▀

Continued from page 1

Pet Projects

the requests are truly related to the year 2000 computer glitch. Supplicants are merely following the money.

But they aren't pulling anything over the eyes of savvy year 2000 managers, many of whom expected as much and in some cases erected clever defenses. In other instances, companies are allowing some requests to get through.

Consider Florida's Orlando Regional Healthcare System, which has pretty much pulled the plug on all information technology spending other than Y2K expenditures.

"We've got people coming out of the woodwork with various and sundry pet projects and trying to tie them to Y2K," said Rick Ridge, year 2000 manager.

Among them have been requests for new automated systems to test medical equipment. Other departments have asked for new or upgraded PCs to run user-developed Microsoft Corp. Access applications, which are a far cry from mission-critical, Ridge said.

Michelle Cammarata, year 2000 manager at Yellow Freight Services Inc., the IT arm of Yellow Freight Co. in Overland Park, Kan., has also fielded her share of requests for new PCs. Mostly, she said, they come from field trucking terminals.

"They write in saying they'd like new PCs because of year 2000 when really the functions they're doing are not affected [by the date change]," Cammarata said. "Still, they'd like a new PC, so they're putting a

Y2K stamp [on their requests]."

Bogus IT funding requests are by no means a new phenomenon. Business managers have been using the technospeak of the day for years to get pet projects approved, according to Scott Shemwell, a 20-year IT veteran and director at Electronic Data Systems Corp. in Houston.

On the Bandwagon

"As each new hot item comes out, there's a tendency to float [requests] in that direction," Shemwell said. "When CAD/CAM came out, we saw some of the same stuff. We could get new computers because we put CAD/CAM in [the request]," he said.

"People have learned that by using the right verbiage in their request for funding, they can get what they ordinarily wouldn't," he added.

Some savvy IT shops were looking ahead and built in defenses.

To prevent financing such slippery requests, Bangor Hydro-Electric Co. in Bangor, Maine, established a strict budget test from the outset of its year 2000 project.

First and foremost, funding was strictly limited to fixing or replacing computer systems that, if left unattended, would cause an operational failure at the electric utility.

"We were careful from Day 1 that our project would only take things that were strictly Y2K-related," said Mike Williams, year 2000 project manager. And with seven months to go, nothing extraneous has slipped through, as far as he can tell, Williams said.

"But that doesn't keep people from trying," he added. ▀

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FRANK HAYES/FRANKLY SPEAKING

It's the users, stupid!

FINALLY! AT LONG last, IT gets some credit for the booming economy. Back on May 6, no less an eminence than Federal Reserve Board Chairman Alan Greenspan announced that IT is a driving force behind continuing economic growth. IT is increasing worker productivity, said his Fed-ness, keeping inflation low as the U.S. economy keeps growing. Ever since Greenspan's pronouncement, IT's deep thinkers have been patting themselves on the back, saying

how much easier it should be now for corporate IT shops to get the budgets they ask for. After all, Greenspan has finally settled the question of whether our IT departments are paying for themselves — right?

Not so fast. The Fed chief didn't credit corporate IT departments for the boom. He said successful corporate IT *investments* get the credit.

Here's a minority view: It's not IT shops that have changed the equation, confirmed the business value of IT and generated an economic miracle.

It's IT users.

As PCs and the Internet became pervasive, users stopped treating IT like a specialized function under the control of the high priests in the glass house. Instead, they started treating it like a business tool they can use themselves.

That's what changed the productivity numbers — more than 4% in recent quarters, after hovering around 1% in the '70s and '80s — and caused Greenspan to toss that May bouquet in our general direction.

It's certainly not that IT departments are suddenly smarter or more effective. We've been putting computers and networks to business use for decades. We've dumped truckloads of money into mainframes, mini-computers, servers, terminals, PCs and a couple generations of wire. And as recently as a few years ago, productivity still hadn't budged.

We haven't changed. Users have — in how they use IT.

It wasn't that long ago that the mainframe never crashed, new systems took two years to

build and users sat through whatever training we sent them to. Today, PCs crash all the time, new programs show up at CompUSA every week, and business users figure out a shocking amount of IT stuff by themselves. And on the Internet? Hah! Everything crashes (or locks up or fails to respond) a half-dozen times before lunch, the Web changes constantly, and none of this so much as slows users down.

Twenty years ago this month, business users got their first reason to treat IT as a tool they could handle when VisiCalc, the first desktop-computer spreadsheet, was introduced at the 1979 West Coast Computer Faire.

Two decades later, users have absorbed it all. They're the ones who changed the way IT is used because they're the ones who began using it. Once users started to control what IT does, instead of IT controlling what users do, they created all that wonderful IT-based productivity we've been trying to generate for decades.

Sure, we did our part. We built the systems and kept them running. We deserve credit for holding up our end of the IT bargain.

But let's not get stupidly self-congratulatory. When we had an iron grip on IT, we were just spending money.

It wasn't until users really bought in and took control of how they use IT that we finally saw big-time results.

But at least we can take comfort knowing that, between IT shops and users, we're finally making the difference. ▀

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

IT users, not IT departments, have improved U.S. productivity.



SHARK TANK

THOSE CRAZY KIDS Steven Broudy, CIO at WestStar Cinemas in Encino, Calif., has lots of PCs that hook his theaters into headquarters — but no Web browsers on them. "We hire a lot of young kids, and we don't want them surfing," Broudy says. "We have enough problems with them loading games on the machines." Hey, we run into the same trouble here in the Tank — with fortysomething sales managers.

THOSE WACKY VENDORS

You'd expect vendor-company execs to kiss up a bit at a big user group meeting. But at last week's J. D. Edwards confab, speakers, including company Chairman Ed McVane and Sun honcho Scott McNealy, cracked a string of jokes about butts, bald heads, pacemakers and, um, let's say Viagra-type problems. Makes you wonder what J. D. Edwards' user demographics look like.

AND DON'T ASK McNEALY

to manage your portfolio. In his speech, he confessed that last year he was offered a seat on the board of a little Internet start-up. He turned them down. The company in question turned out to be eBay. The shares McNealy declined would be worth in the neighborhood of \$130 million now.

THE PRESIDENT'S COUNCIL

on Year 2000 Conversion is

launching a nationwide campaign today to encourage community "conversations" about local Y2K readiness. Don't know about you, but here in the Tank, we're sick to death of Y2K "conversations" in which people sidle up at parties seeking the Real Y2K Lowdown from a Real Computer Guy. Hint: Casually tell 'em you couldn't care less because your bomb shelter is fully stocked.

WHO KNEW QUARTERLY

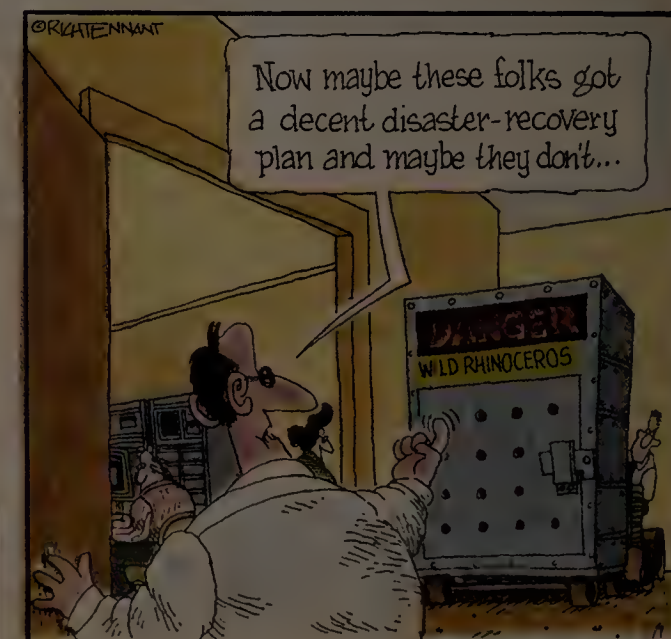
financial results could be so entertaining? Consider this quote: "Zapata Corp. (ZAP): The fish-oil, meat-casings and Internet company reported a net loss for the quarter ended March 31..." Meat casings?

BRISTOL TECHNOLOGY

has a private antitrust case going against Microsoft. Jury selection was last week. Here's a question from the Redmond lawyers: "Do you have any... feeling for or against business organizations or people with substantial wealth that might prevent you from being... completely fair?" The Shark's answer: Only if they made their fortune in fish oil and the Internet.

Got a hot tip on a double-dealing vendor or a stingy employer? Or maybe just feel like gloating because you're an Internet millionaire and the Shark isn't? Shoot an anonymous e-mail to the Tank: sharky@computerworld.com.

The 5th Wave



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CIRCULATIONFAQ

As *Computerworld's* circulation approaches its target of 250,000 IT Leaders—a 63 percent jump in just 18 months—a number of questions have been raised about *Computerworld's* overall strategy. In this first installment of a two-part series, we answer some of those questions.

Why did you decide to add controlled circulation?

Computerworld's circulation strategy has always been designed to serve IT Leaders and to offer marketers efficient access to those IT Leaders. According to IntelliQuest CIMS V5.0, *Computerworld* has the largest average issue audience—proof that the strategy has been successful. However, extensive research conducted in 1998 showed that charging subscribers was a barrier to attracting a significant segment of IT Leaders.

A second factor was the decision to expand the *Computerworld* franchise beyond circulation and advertising revenues by becoming an information services company. By gathering richer data on our circulation file, we will be able to:

- Develop and efficiently market products to sell to our subscribers;
- Expand the *Computerworld* IT Leader Database at a reduced cost;
- Increase our mailing list and e-mail list rental service offerings;
- Successfully launch a top-level Conferences & Events division.

In the end, whether our audience is paid or controlled should be secondary to the size and quality of our subscriber community and the vitality of its relationship with *Computerworld*.

Will *Computerworld* go 100% controlled?

Globally, *Computerworld* has been very successful with a hybrid paid/controlled circulation. In the US, we will continue to renew paid subscribers, but we will use qualified non-paid (QNP) for all new subscriber efforts.

We expect the QNP portion of *Computerworld's* circulation to continue growing quickly as the paid portion gradually trends down. However, we expect that there will always be a solid portion of *Computerworld's* primary subscribers who pay for the publication.

Computerworld's paid subscribers have historically renewed quite well at 59%. Many of the IT Leaders on our paid circulation file have been with us for 5, 10, 15 years or more. It would not make good business sense to walk away from this significant revenue source, which is why we are not converting these paid-circulation IT Leaders into QNP IT Leaders or going totally controlled.

How did you decide that 250,000 is the "right" circulation for *Computerworld*?

Computerworld's focus is solely on delivering IT Leaders. These people tend to be senior executives in mid-sized and larger companies, cluster mostly in IS departments and have significant IT budgets. Prior to launching this circulation effort, we estimated the size of the universe of IT Leaders by using a number of credible external information sources:

- We are targeting organizations with IT budgets of more than \$1 million;
- The Gartner Group projects IT spending at 2–4% of sales;
- Using Dun & Bradstreet site data, we have identified 40,000 sites with the appropriate level of sales;
- Research indicates that there are typically six significant influencers in the IT purchase process in these sites.

This analysis suggests that a circulation of 250,000 will efficiently deliver the base of IT Leaders.

It is also possible to validate the target circulation of 250,000 by considering the number of buyers for major enterprise applications, such as electronic commerce. Of the 26.3 million business influencers in the CIMS database, only 5.5% will purchase E-commerce systems and only 22% of those plan to spend more than \$250,000 on E-commerce. This nets out to only 317,000 buyers who are consistent with the concept of IT Leaders.

Similar patterns hold for other products, leaving us to believe that a circulation of 250,000 IT Leaders is a sound target in this market. Any fewer and we would miss out on powerful IT buyers. Any more and we would have to lower our standards.

Why \$100K minimum qualifier?

We want to deliver class, not mass. Publications with larger circulations have grown primarily by lowering their qualification standards. To ensure that our new subscribers are actually IT Leaders, we are requiring the industry's highest level of personal spending on IT products—four times greater than *PC Week's* qualifier. *Information Week* does not even state a minimum.

For more information on *Computerworld's* circulation, or to obtain a new BPA statement, call your *Computerworld* sales executive or 1-800-343-6474 today.

EDITORIAL CALENDAR

JUNE 7 - AUGUST 16, 1999

WE PASS THE SAVINGS ON TO YOU

The 5-Day Ad Close

There are two things in life we'd all like to save: time and money. With the fastest published advertising close of any weekly enterprise publication, *Computerworld* helps you with at least half that goal. *Computerworld's* advertising close is now Monday at 12 Noon (EST)—three days shorter than the published close date of any weekly enterprise publication and five working days prior to the issue's delivery day of the following Monday. Premium positioning still works on a 10-day close, but the 5-day close gives you a chance to break campaigns more quickly and to react to fast-breaking technology news.

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PACIFIC NORTHWEST
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SOUTHERN CALIFORNIA
949-250-3942

MARKETPLACE/MARKETPACK
508-820-8249

ISSUE DATE	BUSINESS FEATURES	TECHNOLOGY FEATURES	BONUS DISTRIBUTION
JUNE 7 AD CLOSE: MAY 31 RECRUITMENT CLOSE: JUNE 3	<ul style="list-style-type: none"> Beyond the Y2K Challenge (Editorial contact: Allan Alter) Coping with Y2K Staffing IT Salaries for Women IT Education Myths 	Q -Web-based Groupware C -C++, Java & Smalltalk Careers	<ul style="list-style-type: none"> USENIX Technical Conference in Monterey, CA
JUNE 14 AD CLOSE: JUNE 7 RECRUITMENT CLOSE: JUNE 10	<ul style="list-style-type: none"> Government Impact on Corporate IT (Editorial contact: Rick Saia) Researching a Potential Employer CareerAdvisor 	Q -PCI-X Bus C -Java Careers	<ul style="list-style-type: none"> JavaOne Worldwide Developers Conference in San Francisco, CA Oracle Development Tools User Group Conference in Fort Lauderdale, FL IT Consultants & Contractors Conference in Santa Clara, CA Enterprise Architectures Conference in Boston, MA
JUNE 21 AD CLOSE: JUNE 14 RECRUITMENT CLOSE: JUNE 17	<ul style="list-style-type: none"> IT in Brokerages, Insurance and Banking (Editorial contact: Kevin Fogarty) 3rd Annual Hot Skills Report (Editorial contact: David Weldon) Contracts, Rights and Rules for Contractors 	F -Total Cost of Ownership (Editorial contact: Cynthia Morgan) Q -Cable Modems C -Connecticut Careers	<ul style="list-style-type: none"> PC Expo in New York City
JUNE 28 AD CLOSE: JUNE 21 RECRUITMENT CLOSE: JUNE 24	<ul style="list-style-type: none"> The New Cost of an IT Education PDAs, The Super Recruiters CareerAdvisor 	F -Handhelds & Sub-notebooks (Editorial contact: Cathleen Gagne) Q -The Impact of Portals on IT C -Internet Careers	<ul style="list-style-type: none"> Web Design & Development in San Francisco, CA IT Consultants & Contractors Conference in Reston, VA Year 2000 National Symposium/SMART-sourcing Conference in New Orleans, LA VBITS '99 in New York City
JULY 5 AD CLOSE: JUNE 28 RECRUITMENT CLOSE: JULY 1	<ul style="list-style-type: none"> Quarterly Hiring Survey (Editorial contact: David Weldon) 	F -Is Java Ready for Prime Time? (Editorial contact: Cynthia Morgan) Q -Digital Wallets C -Minnesota Careers	
JULY 12 *AD CLOSE: JULY 2 RECRUITMENT CLOSE: JULY 8 * Early close due to Holiday	<ul style="list-style-type: none"> Questionable Career Moves CareerAdvisor 	F -Modernizing Legacy Databases (Editorial contact: James Connolly) Q -Hubs, Routers & Switches C -Insurance Careers	
JULY 19 AD CLOSE: JULY 12 RECRUITMENT CLOSE: JULY 15	<ul style="list-style-type: none"> To be announced (To provide maximum reader value, many business section features are often late-breaking.) 	Q -Common Gateway Interface C -Chicago Careers	
JULY 26 AD CLOSE: JULY 19 RECRUITMENT CLOSE: JULY 22	<ul style="list-style-type: none"> CareerAdvisor 	Q -Next Generation I/O C -Orlando, Jacksonville, Tampa & Tallahassee Careers	
AUGUST 2 AD CLOSE: JULY 26 RECRUITMENT CLOSE: JULY 29	<ul style="list-style-type: none"> To be announced (To provide maximum reader value, many business section features are often late-breaking.) 	F -Tools to Monitor Your Web Site's Use (Editorial contact: Cynthia Morgan) Q -Point to Point Tunneling C -Dallas & Fort Worth Careers	
AUGUST 9 AD CLOSE: AUGUST 2 RECRUITMENT CLOSE: AUGUST 5	<ul style="list-style-type: none"> Examples of Best IT Bosses CareerAdvisor 	F -Building a Corporate Portal (Editorial contact: James Connolly) Q -Storage Area Networks	
AUGUST 16 AD CLOSE: AUGUST 9 RECRUITMENT CLOSE: AUGUST 12	<ul style="list-style-type: none"> To be announced (To provide maximum reader value, many business section features are often late-breaking.) 	Q -Network Appliances C -Virginia Careers	

Key to technology features

F - Field Report features are designed to help corporate IT managers select and implement key technologies, and typically based on user input or technical reviews. (Vendors may send basic information—such as press releases and user names—to contact and *Computerworld* will keep the information on hand for reference.)

Q - QuickStudy, a brief tutorial designed to help readers understand key technologies, terms and trends. (Vendors may contact stefanie_mccann@cw.com.)

C - Careers feature that anchors the recruitment advertising section.

This editorial calendar is subject to change at the discretion of *Computerworld*. Please check with your advertising sales representative to confirm issue editorial content.

COMPUTERWORLD
THE NEWSPAPER FOR IT LEADERS